A Treatise on Arab Music, Chiefly from a Work by Mikhil Mesh?ah, of Damascus
Author(s): Eli Smith and Mikhil Mesh?ah
Reviewed work(s):
Source: *Journal of the American Oriental Society*, Vol. 1, No. 3 (1847), pp. 171+173-217
Published by: American Oriental Society
Stable URL: http://www.jstor.org/stable/3217802
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TREATISE.

INTRODUCTION.

[BY THE TRANSLATOR.]

THE investigations which have led to the compilation of the following article, were not entered into in consequence of a knowledge of the science of music, or of any particular taste for it, for I can lay no claim to either; but in consequence of the necessities of my calling. The mission with which I am connected, has not yet succeeded in introducing singing into Arabic worship. The obstacles which have prevented, are two; *one*, the peculiarities of Arabic versification, the *other*, the equally strong peculiarities of Arab music. The former is such, that a hymn composed according to Arabic rules of prosody, would, in very few cases, if any, be adapted to our tunes; and one composed according to our rules, would be still less adapted to Arab taste. This point, or rather the whole science of Arabic versification, has been thoroughly studied by my colleague in missionary labors, the Rev. C. V. A. Van Dyck, and I hope some early number of the Society's Journal may be enriched by an article, which he has already prepared on that subject.

The obstacles arising from the peculiarities of Arab music are such, that, not only do we find the singing of the Arabs no music to us, but our musicians have found it very difficult, often impossible, to detect the nature of their intervals, or imitate their tunes. The first intimation I had of the nature of the difficulty, was derived from observing, that a native singer, in attempting to repeat the octave in company with one of our musical instruments, did not observe the same intervals, and of course the two were not at every note in unison. Subsequently one of my colleagues attempted to write Arab tunes on our stave, and found that he was unable to do it, owing to some peculiarity in the intervals. But it was not until I fell in with the work, which has served as the basis to this article, that the whole subject was revealed to me. Its author, Mikhâil Meshâkah, of Damascus, is my personal friend and correspondent, and one of the most intelligent of his nation whom I have known. Having a good knowledge of mathematics, as well as much practical skill in music, he was well qualified for his task. In translating, I have abridged his work a good deal, have not always observed his order in the arrangement of the sections, and have frequently taken the liberty to express his thoughts in my own style.

It is of *modern* Arab music only, that Meshâḳah treats; and to explain that, is the specific object of this article. The ancient, having been closely copied from that of the Greeks, has less of oriental interest. The subject of musical *rhythm*, however, perhaps from its natural affinities with versification, the Arabs of those times seem to have treated more in their own style; and, my author being defective here, I have resorted to the ancients. For an ability to do this, I am indebted to the kindness of Professor Salisbury of Yale College, whose valuable collection of Arabic books, contains two very important works on this subject. One is a manuscript in folio, of nearly two hundred pages, by an anonymous author, composed in the year of the Hegira 666. From this I have translated most of the chapter on rhythm, and also the section on the ancient guitar, dealing as freely with it in translating, as with Meshâḳah's work. The other work is Kosegarten's edition of Ispahâny's *kitâb el-aghâny*, (Book of Odes;) to which the editor has prefixed a labored treatise on ancient Arab music, taken chiefly from the great authority on that subject, Fârâby's Book on Music, and containing large extracts from that work. It is from Fârâby as thus quoted, that my extracts are taken. He died at Damascus, A. H. 339. Owing to want of time and feeble health, my examination of these two books has been hasty and superficial. It is hoped that their possessor will erelong cull much more from them, to interest and instruct the lovers of oriental learning.

It is a matter of sincere regret to me, that the compilation of this article has not fallen to some one, capable of throwing an additional interest around it, from a personal acquaintance with the science of music. As it is, I claim only to have done the work of a translator and compiler; and it is possible that even in doing this, I may have fallen into errors, from ignorance of the science under discussion. I have endeavored, in all cases, to make apparent to the reader, the author of every paragraph and sentence. Where no other authority is given, he will understand that it is Meshâḳah who is speaking.

CHAPTER I.

ON THE GENERAL PRINCIPLES OF MELODY.

§ 1. *On the Classification of Tones.*

It is of the nature of sound to be divided into classes, or groups of tones, each containing seven, ascending one above the other; and these groups are, in theory, without limit as to number, each being the *response* to that which is below it, and the *base* to that which is above it. The groups are called *octaves*, (Ar. *dîwân*, a council,) and the tones composing them are called *notes*, (Ar. *burj*, a tower.) Each note has its distinctive name. The first is *yegâh;* the second, *'ösheirân;* the third, *'arâḳ;* the fourth, *rest;* the fifth, *dûgâh;* the sixth, *sîgâh;* the seventh, *jehârgâh.* This is the first octave. Above it is the second, the first note of which is *nawa;* the second *ḥuseiny;* the third *auj;* the fourth *mâhûr;* the fifth *muḥaiyar;* the sixth *buzrek;* and the seventh *mahûrân.* The last is the response to *jehârgâh,* and the end of the second octave. Then comes the third, the first note of which is the response to *nawa,* and is called *remel-tûty;* the second is the response to *ḥuseiny;* the third, the response to *auj,* &c. The notes of the ascending octaves are named in like manner, only repeating an additional "response" for each succeeding one. As, for example, response to the response to *nawa*, &c., and then response to the response to the response to *nawa*, &c., ad infinitum. In like manner, a similar system of nomenclature is used in the descending series of octaves below *yegâh*. In the first, you say the base to *jehârgâh*; the base to *sîgâh*, &c.; and in the next, the base to the base, &c., ad infinitum.

Observe that the beginning of the notes of the octave with *yegâh*, as above, is not necessary in the nature of things. Some authors begin with *rest*; and the Greeks begin with *dûgâh*. One may begin where he chooses, provided he make the octave consist of seven successive notes, so that the eighth shall be the response to the first.

The human voice, in ascending from the base to the response, or in descending from the response to the base, naturally makes but seven notes. Were you, for instance, to divide the octave into *ten* notes, the voice could be brought with great difficulty to strike them; and the effect produced upon the ear would be very disagreeable. Hence it appears, that the division of the octave into seven notes, is according to nature.

§ 2. *On the Classification of the Quarters.*

The notes treated of in the preceding section, ascend one above the other like the steps of a ladder. But the intervals between them are not equal, some being larger than others. These intervals the Arabs divide into *two* classes, greater and less. The greater intervals contain four quarters, and the less three. The former are between *yegâh* and *'ösheirân*; between *rest* and *dûgâh*; and between *jehârgâh* and *nawa*. The latter are between *'ösheirân* and *'arâḳ*; between *'arâḳ* and *rest*; between *dûgâh* and *sîgâh*; and between *sîgâh* and *jehârgâh*. The first class, therefore, contains three intervals with twelve quarters in them; and the second four intervals, having likewise in them twelve quarters. The whole number of quarters in the octave is consequently twenty-four.

[The following table exhibits the Arab scale for two octaves, as explained above, with the names of the notes and quarters.

TABLE I.

SECOND OCTAVE.	15	24	*Remel-tûty.*
	c	23	Response to tek-ḥejâz.
	b	22	Response to ḥejâz.
	a	21	Response to nîm-ḥejâz.
	14	20	*Mâhûrân.*
	b	19	Tek-ḥuseiny-shed.
	a	18	Ḥuseiny-shed.
	13	17	*Buzrek.*
	b	16	Sumbuleh.
	a	15	Nîm-sumbuleh.
	12	14	*Muḥaiyar.*
	c	13	Tek-shahnâz.
	b	12	Shahnâz.
	a	11	Nîm-shahnâz.
	11	10	*Mâhûr.*
	b	9	Tek-nihuft.
	a	8	Nihuft.
	10	7	*Auj.*
	b	6	'Ajem.
	a	5	Nîm-'ajem.
	9	4	*Ḥuseiny.*
	c	3	Tek-ḥisâr.
	b	2	Ḥisâr.
	a	1	Nîm-ḥisâr.
FIRST OCTAVE.	8	24	*Nawa.*
	c	23	Tek-ḥejâz.
	b	22	Ḥejâz.
	a	21	'Araba.
	7	20	*Jehârgâh.*
	b	19	Tek-bûselîk.
	a	18	Bûselîk.
	6	17	*Sîgâh.*
	b	16	Kurdy.
	a	15	Nîm-kurdy.
	5	14	*Dûgâh.*
	c	13	Tek-zergelâh.
	b	12	Zergelâh.
	a	11	Nîm-zergelâh.
	4	10	***Rest.***
	b	9	Tek-kuwesht.
	a	8	Kuwesht.
	3	7	*'Arâk.*
	b	6	Base to 'ajem.
	a	5	Base to nîm-'ajem.
	2	4	*'Ösheirân.*
	c	3	Base to tek-ḥisâr.
	b	2	Base to ḥisăr.
	a	1	Base to nîm-ḥisâr.
	1		*Yegâh.*

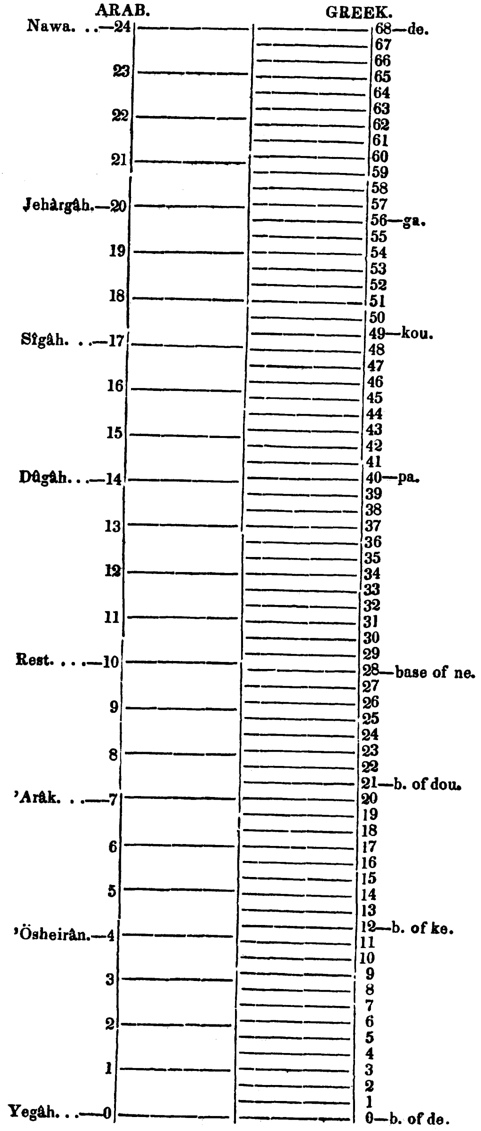
This scale is usually drawn in Arab treatises in the form of a circle. I have given it a shape better suited to occidental taste. In a column on the left I have placed numbers and letters, which, for the convenience of the reader, I propose to use occasionally in the place of the corresponding words on the right. E. g. 2, for *'ösheirân*, 3a for *kuwesht*, &c. The author invariably has the names written in full.—E. S.]

The modern Greeks divide the intervals between the notes into *seconds;* and of the intervals themselves they make *three* classes. The *first* class corresponds to the class of greater intervals in the Arab scale ; only each interval is divided into *twelve seconds.* The *second* class, includes the intervals between *dûgâh* and *sîgâh*, and between *ḥuseiny* and *auj;* and in each of these intervals there are *nine* seconds. The intervals of the *third* class are between *sîgâh* and *jehârgâh;* and between *auj* and *mâhûr;* and each of them has *seven* seconds. In the first class, therefore, there are three intervals, and thirty-six seconds; in the second, two intervals, and eighteen seconds; and in the third, two intervals, and fourteen seconds. And the whole octave contains seven intervals, and sixty-eight seconds.

§ 3. *On the difference between the Arab and Greek scales.*

The Arab and Greek scales coincide at only four points; viz., at the note *yegâh* which coincides with the base to *de;* at the sixth quarter, or the base to *'ajem* which coincides with the seventeenth second; at the twelfth quarter, or *zergelâh*, which coincides with the thirty-fourth second; and at the eighteenth quarter, or *bûselîk*, which coincides with the fifty-first second. All other coincidence between notes in the two scales is merely an approximation. This may be seen by drawing the two scales side by side, so that *yegâh* and *nawa* in one shall coincide with the base to *de* and *de* in the other, as in the following table.

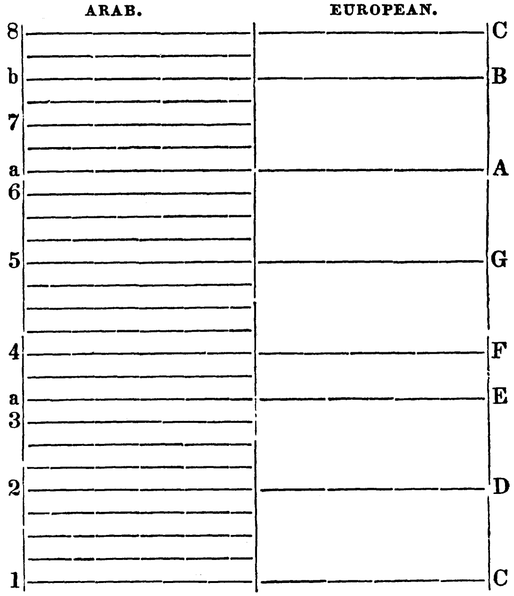
TABLE II. *Comparison of the Arab and Greek Octaves.*



The reason of this difference is, first, the division of the Arab intervals into two classes, while the Greek are divided into three; and second, the division of the Arab octave into twenty-four quarters, and of the Greek into sixty-eight seconds, which two numbers coincide only at four points; [in other words, four is their greatest common measure.—E. S.]

[For the same reason, the Arab and European octaves coincide in all the points of the latter; inasmuch as the greatest common measure of twelve the number of its semitones, and twenty-four, is twelve. But the coincidence at three points in the natural scale is with quarters, viz., *kuwesht*, *bûselik*, and *ḥejâz*; as may be seen in Table III.

Table III. *Comparison of the Arab and European Octaves.*



From the above it appears, that the regular notes of the Arab scale, do not represent our interval of a *third*. It may be added, that Arab music deals only with *melody*. *Harmony* is unknown to it.—E. S.]

§ 4. *On the division of the Octave into two analagous subdivisions.*

From the description of the octave already given, it is evident, that it may be divided into two subdivisions analagous to each other; viz., one from *yegâh* to *dûgâh*, and the other from *rest* to *nawa*. The two notes *rest* and *dûgâh* are included in each; and thus each consists of five notes. So *nawa* is included likewise in the first subdivision of the second octave. The analogy arises from the fact that the successive intervals in one subdivision, are the same as the corresponding intervals in the other. E. g. the interval between *yegâh* and *'ösheirân* is the same as between *rest* and *dûgâh;* and that between *'ösheirân* and *'arâḳ*, the same as that between *dûgâh* and *sîgâh*, &c. In singing, therefore, the descent from *dûgâh* to *yegâh*, is like that from *nawa* to *rest*. Hence there is a correspondence between *rest* and *nawa*, *dûgâh* and *ḥuseiny*, *sîgâh* and *auj*, and *jehârgâh* and *mâhûr*. If the first of either of these pairs of notes, is the key note of a tune, the other is called its *fifth*, (Ar. *ghŭmmâz*, a sycophant,) it being the nearest to it in resemblance, except the response or octave. For if you strike any note you please, and then strike its octave, you have the most agreeable of all successions of sounds; and next to it in agreeableness, is the fifth.

The interval between a note and its fifth, is always fourteen quarters. To find, therefore, the fifth of a note, take the number of the quarter to which the note belongs, then add fourteen to it, and the sum, if it be not more than twenty-four, will show the quarter of the fifth. If the sum be more than twenty-four, subtract twenty-four from it, and the remainder will show the quarter of the fifth in the octave above. E. g. *'ösheirân* is at the fourth quarter, (see Table I.) and you will find its fifth as follows: $4+14=18$, which is the quarter of *bûselik*. Again, *sîgâh* is at the seventeenth quarter, and you proceed as follows: $17+14-24=7$, which is the quarter of *auj* in the octave above.

§ 5. *On variety in tunes, and their division into modes.*

The difference between tunes is of *four* kinds. The *first* is in the *key note*. If you strike, for example, *rest*, then *'arâḳ*, then *'ösheirân*, and end with *yegâh*, making it the key note, the sound differs from what it would be, if you struck *dûgâh*, then *rest*, then *'arâḳ*, and ended with *'ösheirân* for the key note. And this difference does not arise from the height of *dûgâh* and *'ösheirân*, with which you begin and end the one, above *rest* and *yegâh* the first and last notes of the other. For difference in height, were the intervals between all the notes the same, would occasion no variety in tunes, and you might vary the key note, without varying the melody. But as it is, varying the key note varies the tune, because the intervals are unequal, and a succession of them is passed over in the one case, differing from that passed over in the other. As in the example above adduced; in the *first* strain, the *first two* intervals are of *three* quarters each, and the *third* of *four;* while in the *second* strain, the *first* interval is of *four* quarters and the *other two* of *three* quarters each. Thus appears the first kind of difference between tunes. In consequence of it, tunes are divided into *modes* according to their key notes, and are named from them; one being called *rest*, another *dûgâh*, &c.

The *second* difference arises from *two* circumstances independent of the key note, which may remain unchanged. *One* is a difference of execution in passing from note to note, which is not to be described in words, and which the Arabs have no notation, as the Greeks and Franks have, to express. The *other* is a difference in the notes with which different tunes *begin*. The two tunes *dûgâh*, and *ṣŭba*, for example, are both keyed on *dûgâh*, but the first begins with *rest*, and the other with *jehârgâh;* as we shall see when we come to the description of particular tunes.

The *third* difference arises from a *change* of some notes, by substituting certain quarters for them. For example, in the tune called *ḥejâz*, the note *jehârgâh* is not used; but in ascending and descending it is passed over, and the quarter *ḥejâz* is struck in its place. So in the tune *beyâty*, the quarter *'ajem* is used in the place of the note *auj*.

The *fourth* difference arises from the tunes being double; the *first* or *second* cause of difference being united with the *third*. In this case, the voice passes over more than seven notes, striking notes in two octaves, which are the responses and bases to each other. For example, the tune *muḥaiyar* is the tune *dûgâh* repeated; *dûgâh* being first sung on an octave above *dûgâh*, and then the voice descending to the base of that, which is the octave to which *dûgâh* itself belongs. So the tune *shed-'arabân*, is made up of two *ḥejâzes*, on two different octaves. And *'ösheirân* is almost *beyâty*, sung from above *ḥuseiny*, and then ending in *beyâty* on *'ösheirân*.

§ 6. *On Transposition, or the performing of a tune on another than its natural scale.*

Musicians are sometimes obliged to perform tunes on other than their proper key notes. For example, *dûgâh* and *ḥejâz*, whose proper key note is *dûgâh*, are usually performed on *nawa*, in order, by a higher pitch, to give more pleasure to the hearer. This change is sometimes *necessary*. As, when a double tune, which takes in more than one octave, is keyed on a high note. *Shed-'arabân*, for example, whose key note is *dûgâh*, requires the voice to ascend to the response to *ḥuseiny*, which is extremely difficult for most performers, and even if accomplished, produces an unpleasant effect upon the hearer. Hence this tune is generally performed on *yegâh* or *'ösheirân*. The same key notes, also, are generally adopted for the tune *muḥaiyar*. A similar necessity likewise exists, when you wish to play on two instruments together, one of which, as a large *ḳânôn* for example, is made for very low notes, and will not bear tuning for high ones, and the other, as a short *kerift*, is pitched very high. Then the performance on the two will not agree, unless one of the performers transposes the tune so as to play it on such a key note as shall accord with the key note on which the other performs. Hence the professors of the art of music, have found it necessary to be exceedingly careful in the composition of tunes, to define and observe the exact number of quarters which compose the intervals between the different notes. For it is only in consequence of this exactness, that the musician is able to transpose a tune by changing its key note.

For illustration of what has been said above, take two examples. *First;* suppose it be desired to transpose a tune keyed on *dûgâh*, so as to perform it on *nawa*. Then it will be necessary to change two notes, *ḥuseiny* and *auj*, by striking instead of them, the quarters *tek-ḥiṣâr* and *'ajem*, next below them. This being done, the succession of intervals in the transposed tune, will be the same as in the original, as may be seen in Table IV., below.

Second ; suppose it be desired to transpose a tune on ***rest*** so that it can be performed on ***nawa***. Inasmuch as ***nawa*** is a fifth above ***rest***, the first five notes will require no change, for reasons explained in section 4. But the next two notes do not correspond, and it becomes necessary to raise ***buzerek*** and ***mâhûrân*** each one quarter, by using the quarters ***response to bûselîk*** and ***response to nîm-ḥejâz***, instead of them, in order to preserve the intervals of the original tune, as may be seen in Table V.

TABLE IV.

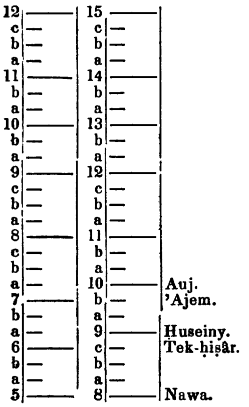
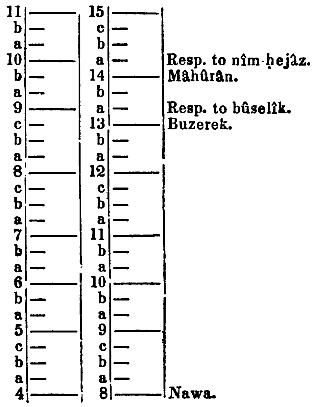


TABLE V.



CHAPTER II.

DESCRIPTION OF MELODIES NOW IN USE.

IN this chapter, I have arranged the melodies now used in Syria, each under its key note, without regard to their relative congruity, giving to each key note a distinct section. These sections thus amount to eleven, but the melodies are ninety-five.

§ 1. *Melodies keyed on Yegâh.*

1. *Nehuft of the Arabs.* Its notes are *nawa*, *mâhûr*, then *nehuft*, then *tek-ḥiṣâr*, then *nawa*, then it ascends note by note to *rest*, then *base to nehuft* called *kuwesht*, then *base to tek-ḥiṣâr*, then *yegâh.** This arrangement differs from *ḥejâz-nawa* only in the execution, and the key note.

2. *Shed-'arabân.* This is in fact *ḥejâz* repeated in two octaves, to render the pitch easy for the singer. Its notes are 8, 8b, 8, 11, 10a, 8b, 8, 12, 12b, 12, 11, 10a, 8b, 8, 7, 5b, 5, 4, 3a, 2, 1. (See Arab Tune, No. 1.)

3. *Nehuft of the Turks.* Its arrangement is exactly that of *mâhûr* transposed to *yegâh ;* differing from it only in the execution, and the pitch. Its notes are, 8, 9, 7b, 6a, 8, 10, 9, 8, 7b, 6a, 5, 4, 3, 2, 1.

4. *Nawa,* called *yegâh.* This is also *mâhûr*, transposed to *yegâh.* Its notes are, 8 distinctly,† then 7b, 6a, then it descends to 3, then 4, 3, 2, 1.

§ 2. *Melodies keyed on 'Ösheirân.*

1. *'Osheirân.* First perform *beyâty* on 9, as will be explained in § 5, then 8, 7, 6a, 5, 4, 3, 2.

2. *'Ajem-'ösheirân.* First perform *neirîz* as directed in § 5, then descend to 2, and stop.

[* Thus our author goes on through the whole ninety-five tunes, describing each by naming every note in it. I have sought for brevity by substituting for the *names* of the notes, the *numbers* and *letters* introduced into Table I. of the preceding chapter. It will be perceived, that all the tunes are in the state which the author subsequently calls "free," (see chap. 3, § 1,) not being fixed either as to rhythm, or length of notes. I have written a few of the tunes on lines corresponding to the Arab intervals, in order that the reader may the more readily see their composition. The *intervals* simply, are all that I have aimed to exhibit. Every regular note is written *on* a line ; of the quarters, the *lower touches* the *lower* line, the *upper* touches the *upper* line, and where there are three the *middle touches neither.* I have added the letters of our octave, for the sake of comparison.—E S.]

† [The words translated "distinctly," "glanced at," "obscurely," and "lightly touched," appear to be used technically, and their technical meaning I do not fully understand. The last three appear to be used interchangeably.—E. S.]

3. *Muâḳbil-'ösheirân.* Its notes are 9, 11, 10a, repeated to 9, then 11, then it descends note by note with 6a, to 2.

§ 3. *Melodies keyed on 'Arâḳ.*

1. *'Arâḳ.* It is 8, then descends note by note to 3. (See Tune No. 2.)

2. *Sulṭân-'arâḳ.* Its notes are, 8, 7b repeated, then it descends note by note to 3, ascends to 11, then descends note by note to 5. It ought properly to be classed with the melodies keyed on 5; but the masters have put it here, and I have followed them, as I shall likewise do in some other cases of irregularity. Only let the reader remember, that the classification is theirs and not mine.

3. *'Arâḳ zemzemy.* Its notes are 3, 4, 5, then 8, then it descends note by note to 3, then 6 distinctly to 5, then 9b glanced at, then it descends note by note to 5, then 6 distinctly, then descends note by note to 1, then 4, then 6, then 8, then descends note by note to 5. (See Tune No. 3.)

4. *Mukhâlif-'arâk.* Its notes are 3, 4, 5, 7, 6, 5, 4, 3.

5. *Râḥat el-arwâḥ.* Its notes are, 8, 7b repeated, 5, 5b, 5, 4, 5b, 5, 4, 3. (See Tune No. 4.)

6. *Râḥat el-arwâḥ of the Greeks.* It is the same as *ḥejâz* to 4, then 5, 5b, 5, 4, 3.

7. *Remel.* Its notes are, 8, 7 repeated, then 8, 7b, then 9 glanced at, then 8, 7 repeated with 6b, then 7, then 8 glanced at, then 6 distinctly, 5, 4, 3. (See Tune No. 5.)

8. *Râḥat shedha.* It is the same as *ṣŭba,* only stopping at 3.

§ 4. *Melodies keyed on Rest.*

1. *Rest.* Its notes are, 4, 5, and thus ascending to 8, then return to 4, then 1, then stop at 4.

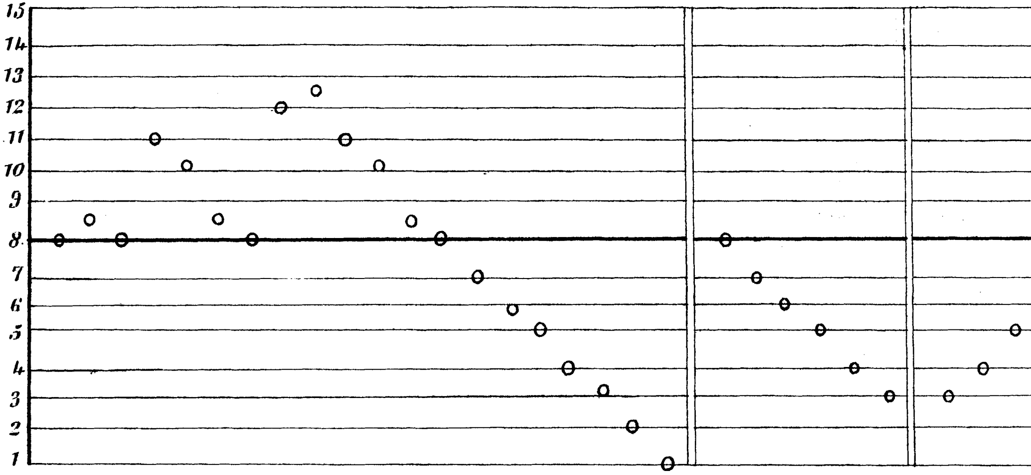
2. *Nikrîz.* Begin with 8, then 7b, 6 distinctly, 9, 8 distinctly, 7b, 6, 5, 4. Hence it appears that 7 is altered in this melody to 7b. (See Tune No. 6.)

3. *Sâdhkâr eṣ-ṣaḥîḥ.* Strike 6 distinctly, then press upon 6a, then 5 distinctly, 8, 6a, 5, 2, 3, 4.

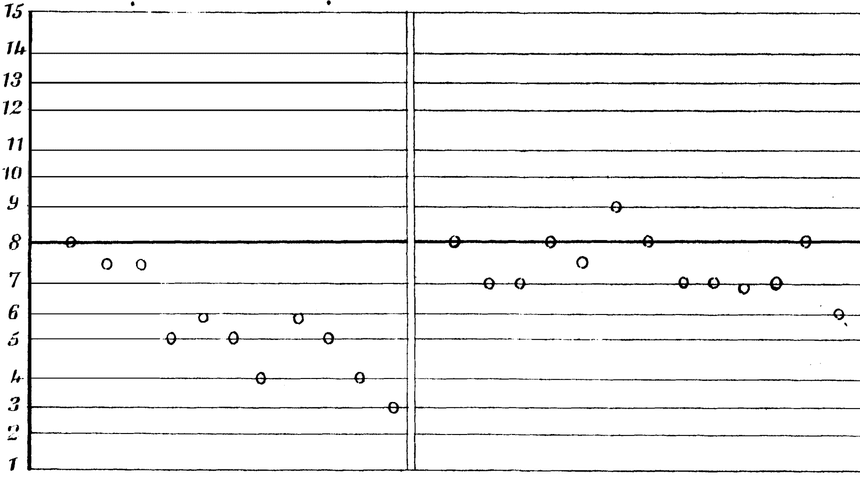
4. *Ma-renna.* It is *ṣŭba* keyed on *rest.*

ARAB TU

Nº 1. Shed 'Arabân   Nº 2. Arâḳ



Nº 4. Râḥat el-Arwâḥ   Nº 5. Remel



Nº 8. Penjgâh   Nº 9. Sâdhkâr el Muta'ârif

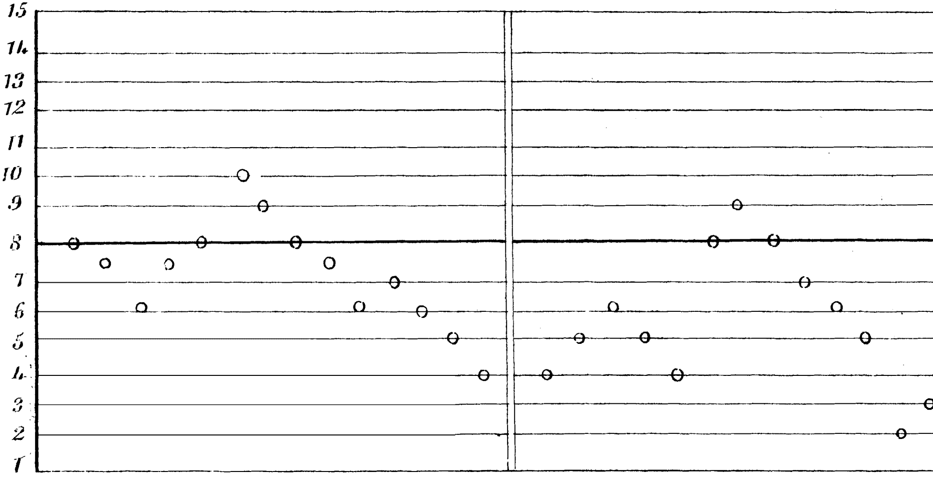
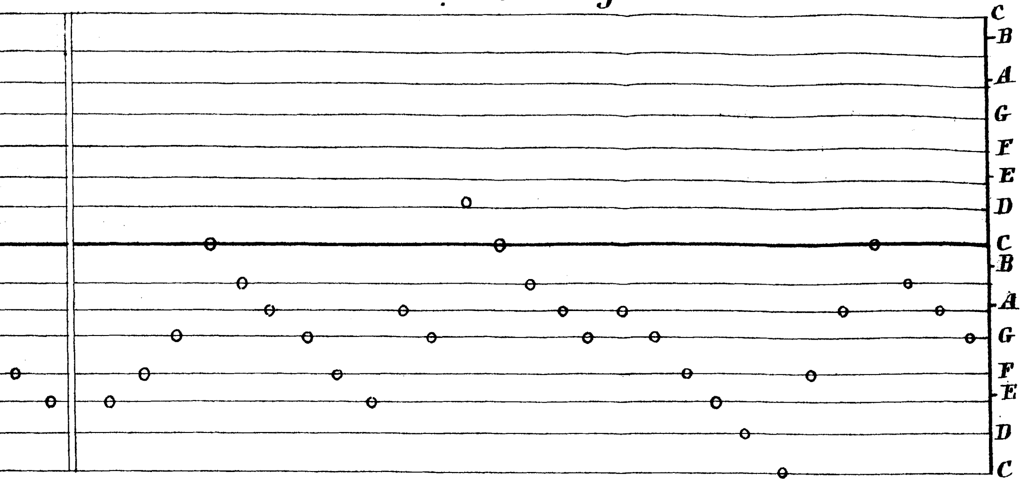


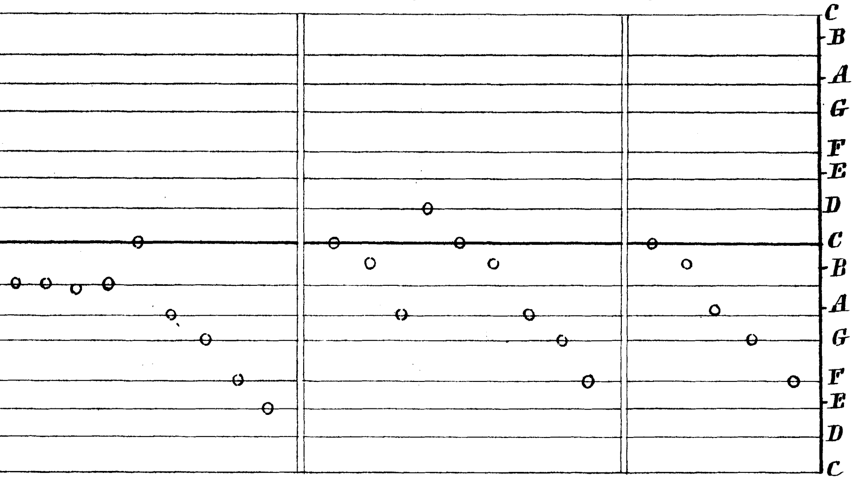
Plate 1.

B TUNES.

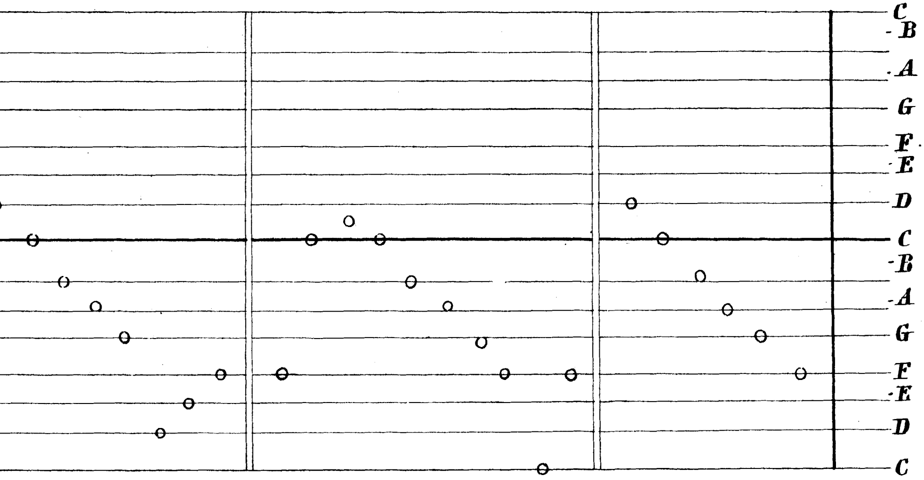
N°. 3. 'Arâk Zemzemy



mel N°. 6. Nihrîz N°. 7 Nishâwerk



l Muta'ârif N°. 10. Ḥejâzkâr. N°. 11. Shâwerk of the Egyptians.



5. *Nîshâwerk.* It is 8 distinctly, then 7b, 6a, 5, 4. In this 7 and 6 are altered to 7b and 6a. Such, at least, is the doctrine of the masters. But my opinion is, that this is to be regarded as one of the tunes that are keyed on 7. Then will its notes be, 11 distinctly, 10, 9, 8, 7; and the intervals will remain the same as above, while the use of quarters is avoided. If it be objected, that 10 corresponds to 7a and not to 7b, and that thus it becomes necessary to use 10a for 10, so that after all, quarters are not avoided, and therefore little is gained; my reply is, *first*, that 7b is generic and includes 7a and 7c; and if this is not allowed, my *second* reply is, that in the first arrangement two quarters are used, and in the latter but one, so that there is, after all, a gain. (See Tune No. 7.)

6. *Penjgâh.* It is 8 distinctly, then 7b, 6a distinctly, 7b, 8, 10 distinctly, 9, 8 distinctly, 7b, 6a distinctly, 7 distinctly, 6, 5, 4. Hence it appears that, in this melody, 7 and 6 are at first altered, and then in the end restored. (See Tune No. 8.)

7. *Sâdhkâr el-muta'ârif.* It is 4, 5, 6a distinctly, 5, 4, 8 distinctly, 9 distinctly, 8, 7, 6a, 5 distinctly, 2, 3, 4. Thus in this tune, the quarter 6a is used for the tone 6. And the truth is, that it does not differ from the tune *jehârgâh*, except in the execution, as the intervals are exactly the same. (See Tune No. 9.)

8. *Ḥejâzkâr.* It is 4, 8 distinctly, 8b, 8 distinctly, 7 distinctly, 6a, 4c, 4, 1, 4. Thus the Constantinople masters have arranged it. In it 5 and 6 are altered to 4c and 6a. Evidently this arrangement is that which is necessary for the performance of the tune *ḥejâz* itself; except that the quarter 7b must be made 7a. And if it be thus arranged, and 5 be made its key note, it will be easier, or only one note, viz. 7, will be altered to a quarter. (See Tune No. 10.)

9. *Shâwerk of the Egyptians.* It is 9 distinctly, 8 obscurely, then 7a and 6a each distinctly, then 5, 4. It ought to have been regarded as one of the branches of *jehârgâh*, and then the tones would have remained whole. (See Tune No. 11.)

§ 5. *Melodies keyed on Dûgâh.*

1. *Dûgâh*, called *'Ashshâḳ of the Turks.* It is 5, 4, 5, 4, 5, 4, 8, 7, 6, 5, 4, 5, then ascends note by note distinctly

to 9, then 9b, 8, 7 distinctly, 6, 5. Most of the Syrians consider it a variety of the tune *beyâty*, by reason of its being keyed on 5, and the use in it of 9b for 10. The difference will be pointed out in treating of *beyâty*, and its varieties.

2. *Ṣŭba*, called *Rekb*. It is 7 distinctly, 9 glanced at, 7, 6, 5.

3. *Ṣŭba hemâyûn*. It is 4, 6 distinctly, 5b, 5, 4 obscurely, 7 distinctly, 6, 5. In this, the quarter 5b is not used in the place of a regular tone for forming the melody, but is merely glanced at; since the tones above and below it, are not dispensed with.

4. *Ṣŭba-châwîsh*. It is 7 distinctly, then 7b and 7 each distinctly, 11 distinctly, 11b glanced at, 11, 9b distinctly, 9, 7b, 7, 6, 5. In it, 8 and 10 are altered to 7b and 9b; and by reason of the altering of 8, its fifth 12 is also altered and 11b is glanced at in its place, inasmuch as it is the fifth of 7b, which has taken the place of 8. In our day, the Egyptians often use the movements of this melody in singing *ṣŭba*, except that they rarely ascend in it to 11.

5. *Nâdy*. It is 8 distinctly, then 7, 6a obscurely, 5. In it 6 is altered to 6a.

6. *Beyâty 'ajemy*. It is 8 somewhat distinctly, 9b very distinctly, 9, then 8 and 7 distinctly, 9b, 9, 8, 7, 6, 5. In it 10 is altered to 9b, and the voice does not rise above 9b.

7. *Beyâty-nawa*. It is 8 distinctly, then 8a lightly touched, then 8, 7 distinctly, 8, 8b, 8, 7, 6 distinctly, 9b, 9, 8, 7, 6, 5. In it 9b is substituted for 10; but 9 remains, except that 8a is glanced at in the beginning.

8. *Beyâty-ḥuseiny*. It is 9 distinctly, then 9a lightly touched, then 9, 8 distinctly, 7, 6 distinctly, 8, 9, then descends note by note to 5. In this, nothing above 10 is used, and 9b is used in the place of 10. The Syrians, in our day, know this as *beyâty*, but the Egyptians call it *neirîz*. The true *neirîz*, however, is something else, as will soon appear.

9. *Shûry-beyâty*. It is 8 distinctly, then 11, 10a, 8c, 8 distinctly, 7, 6a distinctly, 8, 8b, 8, then descends note by note distinctly to 4, then 9b, then descends note by note to 5. It is composed of two melodies, viz., *ḥejâz* at the beginning, keyed on 8, whence the necessity of substituting 8b and 10a for 9 and 10; and *beyâty-ḥuseiny* at the

end, in which 8b is dropped and 9 used, and 10a is dropped and 9b used; so that only 10 is altered throughout, 10a being used for it in the first place, and then 9b.

10. *Zûry-beyâty.* It is 8 distinctly, 12, 11, 9b, 9, 8, then 7, 6a distinctly, 9b, then descends note by note to 5. In it 9b is substituted for 10; but 6 is not altered throughout, only at first 6a is used for it, and then at last 6a is dropped and 6 is used.

11. *Zeirakend.* In it you are to treat 8 as 5, by using 8b and 9b instead of 9 and 10, and perform upon it the tune *ṣŭba*, then 7, 6, 9b, 8b, and then descend note by note to 5. Thus the masters have described it. But my view is, that you are to perform *ṣŭba* on 5, and then descend note by note from 7 to 2. For thus the same intervals are preserved, and the extreme awkwardness of their directions, as well as the inconvenience of using quarters, is avoided. In reference to this tune, it is to be observed, that it is the very tune now known in Syria, as the *ẓŭrfakend;* while the real *ẓŭrfakend* is another thing, as will appear in its place.

12. *Ḥuseiny.* It is 9, 7, 8, 9 distinctly, then 11 and 10 each obscurely, then 8 distinctly with 7b, then 8, 9, 11, then descends note by note to 5. The quarter 7b is not used throughout, but only when the performer is coming down to it, intending again to ascend from it. When he intends to go below it, whether to reach the key note and end the tune, or to ascend again before reaching the key note, and also in ascending from below to above it, it is passed by and 7 is used. N. B. When we subjoin to any note or quarter the word "distinctly," and say "descend note by note" to a given note, our meaning is, that only the regular notes, and not the quarters, shall be struck.

13. *Ḥuseinik.* It is 9, 8b, 8 obscurely, 7, 6, 5.

14. *Bûselik,* generally known as *'Ashshaḳ.* It is 9, 8, 7, 6a, 5. In it 6a is substituted for 6.

15. *Ḥiṣâr-bûselik.* It is 9 and 8b repeated, then 12, 11b, 10, 9, 8b, 7, 6a, 5. Thus this tune is highly irregular, for in it three notes, viz., 6, 8 and 11 are altered, and the quarters 6a, 8b and 11b are used in their places. I have known some musicians transpose it to 3, in order to avoid this irregularity; in which case they raise 4 a quarter to 4a, and

lower 5 a quarter to 4c, thus preserving the same intervals, and making 3 the key note.

16. *Ḥiṣâr.* It is like the preceding, except that 6 is retained, and 6a not used.

17. *Shahnâẓ.* It is 12 with 11b repeated, then 10, 12, 11b, 9, 8, 10, 9, then the tune *ḥejâz* to its end on 5. In it 7b and 11b are used for 7 and 11.

18. *Shahnâẓ-bûselîk.* It is the tune *shahnâẓ* entire, then 8, 7, 6a, 5. Hence it appears that the proper *shahnâẓ* has with it the tune *ḥejâz*, and this has not, but has instead of it *bûselîk.* Therefore in this, 6 is altered, and in that 7, and in both 11.

19. *Kurdy-ḥuseiny.* It is the tune *ḥuseiny*, except that 5b is used in it for 6, and it descends to 5 with 4.

20. *Ẓŭrfakend.* It is 11 and 10 repeated, then 11 to 8 distinctly, then 11, then 8 and 9 obscurely, then 10 distinctly, then 11, 10, 9, 8 distinctly, then 9b obscurely, then descends note by note to 6, then 5, 4, 11 with 12 glanced at, then descends note by note to 5. In it no note is dispensed with, but only in some of the movements 9b is glanced at, if the beginning of the descent be from it, and not from above it. N. B. This tune and the one which follows, and also some others, the masters in Egypt do not, in our day, distinguish from the tune *ḥuseiny;* and that, because of their want of a thorough acquaintance with the science. For their principal aim being to give such point to the words, and expression to the music, as shall provoke their hearers to low mirth, and a departure from the rules of good manners, they care little to ground themselves in the principles of the science, and its details.

21. *Nejdy-ḥuseiny.* It is 11 distinctly, then descends note by note to 7, then 8, 9, then 9b glanced at, and descends note by note to 6, then 7, 11, then descends note by note to 5. In this also 9b is only glanced at, when it is the highest point from which you descend.

22. *Ṣŭba-ḥuseiny.* In it put 9 in the place of 5, and perform on it the tune *ṣŭba*, then descend to 8, 7, and finish with *ṣŭba* proper on 5.

23. *Shurûḳy.* It is 9 distinctly, then 11 and 10 obscurely, 9 distinctly, 8, 7b, 5, then end with the tune *ṣŭba.* In

the beginning, and when descending from above, it will be perceived that 7b is used for 7, then in the end it is dropped and 7 is used.

24. *'Arûb.* It is the tune *ḥejâz* entire, then descends to 2, then returns to 5. In it 7b is used for 7.

25. *Ḥejâz.* It is 8 distinctly, then 7b, then 6, 5. In it, as in the preceding, 7b is used for 7. But in our day *ḥejâz* is commonly performed like the tune *'araba*, and in most cases its performers ascend to 10, and even higher.

26. *'Araba.* It is 8 distinctly with 7a repeated, then 9 distinctly, then 8, 7a distinctly, 6, 5. In it 7a is used for 7.

27. *Iṣfahân ḥejâzy.* It is 8 distinctly, then 7b, both repeated, then 9, 8, 7b, 6, 9, 8, 7b, 6, 5. In this also 7b is used for 7.

28. *Shâwerk.* It is 8 distinctly, then 9, 8, 7a, 6a, 5. Thus the masters have described it; but it would be better to treat it as one of the tunes that are keyed on 8, and then there would be no need of using quarters, as may be seen by a comparison of the intervals.

29. *Ma-renna of the Greeks.* It is the tune *shahnâẓ* above described; then in descending to the key note, the tune *ṣûba* is used, instead of *ḥejâz* with which *shahnâẓ* concludes. So that in this only 11 is altered, 11b being used in its place.

30. *'Arazbây.* It is 11 distinctly, then 9b, 9, 11, 9b, 9, 8, 7, 9b, 9, 8 to 5. In it 9b is used for 10.

31. *Rendân.* It is 11, 10a, 8c, 8, 7, then *beyâty* to 5. Thus it stands described, and consequently 10a, and 8c are used for 10 and 9. But it would be better to treat it as one of the branches of *'ösheirân*, and then only one quarter would be used, viz. 7c for 7.

32. *Neirîz.* It is 9b distinctly, 11, 12, 11, 9b, 9, 8, 7, 5b, 5. But if, after this, you descend to 2 and stop, it is called *'ajem-'ösheirân.* In it 9b is used for 10, and 5b for 6.

33. *Bâba-ṭâhir.* It is 12, 13 glanced at, 12, 11, 10, 11, 10, 9, 8, 9, 8, 7, 6, 7, 6, 5, 4, then *'arazbây.* In it no note is altered; only on taking up *'arazbây*, 9b is used.

34. *Muḥaiyar.* Take 12 for 5, and perform upon it the tune *ṣûba;* then descend to 9, and perform *ṣûba* upon it also, and then descend to 5, and in like manner perform *ṣûba* upon it.

35. *Muḳâbil-muḥaiyar.* It is 12, then descends note by note to 8, then *beyâty-nawa* to 5. In it, at the end only 8b is lightly touched, by reason of its closing with *beyâty.*

36. *'Abkary.* It is 4, 6, then 5a to 4, then closes with the tune *ḥejâz* to 5. In it 5a is at first used for 5; and then in closing with *ḥejâz,* 5a is abandoned and 5 ends it as the key note, while 7b is used for 7.

37. *Ghuzzâl.* In it, perform *ḥejâz,* then strike 4, 3a, 1c, 1, then return to 5. The explanation of the tune is, that it is [in the beginning] *ḥejâz* on 5, then it descends with the movement of *ḥejâz* on 1, and then returns and stops on 5. So it would be were you to perform *ḥejâz* on 9, and then descend with the movement of *ḥejâz* on 5, and return and stop on 9.

38. *Zergelâh.* It is one of the tunes which are keyed on quarters; all of which, inasmuch as they are but few, it has seemed best to class under the nearest note, in order to avoid the necessity of distinct sections. It is 5, 4b repeated, 6a, 7b, 8, 7b, 6a, 7 distinctly, 6a, 5, and stop on 4b.

39. *Esky zergelâh.* It is 5, 4b, 3, 4b, 5, then closes with *ḥejâz.* In it, at the beginning, 4b is used for 4, and in the end 7b is used for 7.

40. *'Ajem Bûselîk.* It is the tune *'ajem,* then 9, and then the tune *bûselik* on 5.

41. *Kara Dûgâh.* It is *ṣûba* to 5, then 4b, 3, 5. In it 4b is used for 4.

§ 6. *Melodies keyed on Sîgâh.*

1. *Sîgâh.* It is 6, 4, 6, 8 distinctly, 11, 10, 9, 8, 7, 6. In it no quarters are used. But the Egyptian masters use 8b for 9.

2. *Musta'âr.* It is 9 distinctly, 8, 7b, 10 distinctly, 9a, 9, 8, 7b, 6; and does not descend to 4. In it, 7b is used for 7. But 9a is used only in descending to the key note after leaving 10; and that, as if it were the beginning of the movement. For it will not answer to follow 10 with 9a, or 9b, and then the two with 9, inasmuch as a succession of three notes at unequal distances in the space of two tones, is opposed to the nature of the human voice, as was explained in chap. 1, § 1.

3. *Ḥazâm.* It is 8 distinctly, 8b, 8, 7b, 11, 10a, 8b, 8, 7, 6. In it 8b and 10a are used for 9 and 10; but 7b is used only at the opening, and then 7 takes its place.

4. *Ḥadhâm.* It is 8 distinctly, 7b, 8, 9, 8, 7, 6, 5, 4, 6. In it 7b is used at the beginning, and afterwards abandoned.

5. *Mâyâh.* It has the composition of *beyâty nawa* to 5, then to 6.

6. *Selemek.* It is 8 distinctly, then 8a, 8, 7, 8a, 8, 7, 6. In it 8a is used for 9.

7. *Ḥiṣâr Sîgâh.* It is 10 distinctly, 9a, 10, 11, 12a, 13, 14a, 13, 12a, 11, 10, then descends note by note to 6. In it, there are many substitutions, in consequence of the use of quarters, some of which are abandoned after being used. Among them, 12a and 14a are used for 12 and 14. But 9a is used only at the beginning for 9, and then 9 takes its place. Were 9a not used, it would have been better to say, that this melody begins with *ḥejâz* transposed to 8, and ends with *sîgâh* on 6, as you will see by comparing the intervals.

8. *Bestnîkâr.* It is 10, 11, 10, 9, 8 distinctly, 11, then descends note by note to 6. In it no note is altered. The difference between it and *sîgâh,* is in the execution only; for *sîgâh* begins with 6 and 4, and this with 8 and 11.

9. *Nejdy-sîgâh.* It is 6, 7, 8, 9, 10, 9, 8, 9, 10, 11, then descends note by note to 6. This tune also differs from *sîgâh* only in the performance.

10. *'Ajem Sîgâh.* It is the same as *'ajem,* only stopping at 6.

11. *Buzrek,* called also *ṣŭlât Allah.* It is 13, 11, 12b, 13, then descends note by note to 6.

12. *'Arâḳ Penjgâh.* It is 8 distinctly, 8c, 9b, 8c, 8, 11, 8c, 11, 9b, 8c, 8, 7, 6. Thus it stands described, and according to the description 8c and 9b are used for 9 and 10. But the right way would have been to class it among the tunes keyed on 3, and then no quarters would have been used.

§ 7. *Melodies keyed on Jehârgâh.*

1. *Jehârgâh.* It is 7, 8, 7, 11, 9b, 9, 8, 7, 6, 5, 4, 11, 9b, 9 to 7. In it 9b is used for 10.

2. *Zunguleh.* It is 7, 8, 7, 6 distinctly, 7, 11, 9b, 9, 8, 7. It differs from the preceding only in the execution.

3. *Mâhûrân.* It is 14, then descends to 11, then 9b, 9, 8, 7. In it 9b is used for 10.

§ 8. *Melodies keyed on Nawa.*

1. *Nawa.* It is 8, 9, 9b, 9, then descends note by note to 5, and stops; though some stop on 8. In it 9b is used for 10.

2. *Nahâwend.* It is 8, 12, 9b, 9, 8, 7 and 8 repeated, 7, 5b, 4, 8. In it two notes, viz., 11 and 5 are lost entirely; and two, viz., 10 and 6 are altered to 9b and 5b. Thus the masters have described it.

3. *Nahâwend es-ṣughîr.* It is 8, 11, 9b, 9, 8, 7b. Thus it stands described; but some musicians perform it on 3, or 10, without using quarters.

4. *Rahâwy.* It is 8, 9, 8 and 9b repeated, 9, 8, 9b, 8. Some perform it on 6, with 7a and 5a, thus preserving the same intervals.

5. *Nîshâpôr.* It is 8, 9, 10 distinctly, 11, 9b, 9, 8, 7b, 6a, 8. In it 6 and 7 are altered to 6a and 7b; but 9 is used for 10 only in coming down from 11. It would have been more correct to class it with the melodies keyed on 4; and then there would have been no need of quarters, except in coming down from 7 to 4, when 5b would have been used for 6.

§ 9. *Melody on Ḥuseiny.*

Ḥuseiny of the Egyptians. It is 11, 10 repeated three times, then finish *ṣŭba* on 9, then ascend to 11, and descend note by note to 7, then ascend to 9, and descend note by note to 4, and stop on 5, then ascend to 11, and perform *ṣŭba* on 9, and stop on it; though some return to 5, and stop on that.

§ 10. *Melodies keyed on Auj.*

1. *Auj.* It is 10, 9 distinctly, 7b with 8, 9, 10, 11, 12, 13 glanced at with 12, 11, 10, then descends note by note

to 3. In it no note is dispensed with; but the use of 7b is only when the movement is from 8 and upwards; in going down with the aim of reaching the key note, it is 7, and not 7b, that is used.

2. *Pehlawân.* It is 10, 9, 8, 7b, and stops on 6a, then returns to 10.

3. *Auj Dârah.* It is *auj* entire, then 11a, 10, 9a, 8, 7, 6, 5a, 4, 3, then returns to 10.

4. *Auj Ḥiṣâry.* It is the tune *auj* as above; then descends to 8, then *shed-'arabân* distinctly, then 7, 5b, 3.

5. *Auj Khurâsân.* It is first the tune *auj*, then *hejâz*, and stops on 5.

6. *'Ajem.* It is exactly the tune *neirîz*, then returns and stops on 9b. It is mentioned here because 9b is a portion of the tune *auj*.

§ 11. *Melodies keyed on Mâhûr.*

1. *Mâhûr.* It is 11, 10, 9, 8, 9, 8, 7, 6a, 5, 4, 6, 11 to 4.

2. *Kârdâny 'Araby.* It is *mâhûr* without 6a, then 11, then the tune *beyâty*.

3. *Remel-tûty.* Begins with 15, then the tune *remel*, stopping on 11.

CHAPTER III.

ON MUSICAL RHYTHM.

§ 1. *General Remarks.*

Having treated of the construction of melodies, we come now to speak of their rhythm. Melodies are sometimes *fixed;* i. e. have their parts set to certain rhythmical movements, so that when the key note is reached, the whole is repeated without change. They are then sung to words of measured syllables, arranged in a succession of rhythmical measures, corresponding to their own rhythm, and called odes. In other cases, melodies are *free;* i. e. the movement of their parts is optional, and set to no rhythmical measure. Such may be sung, either to words having the rhythmical measure of poetry, or to unmeasured-words, like a verse of the Koran. In singing to either, the performer may follow his taste to the extent of his genius, adapting any, or all, of the known melodies, to the same words. And even when he begins with one melody, he may pass to another, as a play of his art; provided he always returns to the key note of the first, at the end. This, when one person is performing alone.

The movements of the fixed melodies are regulated by certain rhythmical laws, invented to guide a company of musicians, so that, by not anticipating or falling behind each other, they may perform as if they were but one individual. These laws are composed with the aid of terms borrowed from the technicalities of versification; especially the ***light sebab*** and ***heavy sebab***, represented by ***dum*** and ***teka***, which, repeated and arranged in different orders, compose certain expressions like the feet of poetic metres, and serve to measure the different rhythms, while they also have names that distinguish one rhythm from another. When one wishes to set a tune to an ode, he selects the melody, and then fixes its movements to some one of the rhythmical measures which suits it. But the ability to set melodies to particular odes, can be arrived at by no knowledge of the rules of the art, any more than a knowledge of the rules of versification can enable a man to write poetry. Native genius is necessary to success in either.

[Thus far Meshâḳah. The remainder of the chapter is taken chiefly from the anonymous manuscript of Professor Salisbury, mentioned in the introduction. In that, terms borrowed from the technicalities of versification, alluded to above, are largely introduced; and some explanation of such as occur, may therefore not be out of place.

The "*light sebab*" is the smallest portion of a poetic foot in Arabic, and is a compound syllable, i. e. consists of two consonants with a vowel between them, as *dum*, or *tan*. A "***heavy sebab***" is two simple syllables, i. e. it consists of two consonants with a vowel after each, as *teka*, or *tana*. A syllable *beginning* with a vowel, the language does not admit of. The "*collected watad*" consists of three consonants, with vowels after the first two, as *tanan*. The "*fâṣileh*" consists of four consonants, with vowels after the first three, as *tananan*.

From the above, as elements, poetic feet are composed. The feet are not called by particular names, such as iambus or spondee; but are represented by artificial words, which in their own composition actually contain the measure of the foot in question. These words are all formed from the root *fa'al*, the same root from which are derived the names of the conjugations of the verb in Hebrew grammar. In Arabic, this root not only furnishes the model for the conjugation of the verb in all its forms with their numerous derivations, but is also used in prosody to exemplify and give name to all the feet; and here too we meet it in music, measuring out the different kinds of rhythm. Thus, *mufâ'ilum* is a foot composed of two *collected watads*, and equivalent to *tanan tanan*. Our prosodists would call it a double iambus, and represent it thus ⏑ – ⏑ –. In our system of music, it would be represented by four notes, of which the second and fourth would be double the first and third respectively.

The reader will understand that, in writing Arabic words with English letters, the apostrophe (') stands for the Arabic consonant *'ain;* and the circumflex accent (^) for a letter, which in prosody is equivalent to a consonant, and follows the vowel over which the accent stands.—E. S.]

§ 2. *Development of the Laws of Rhythm.*

[From the anonymous MS.]

Rhythm is a collection of beats,* separated by times of definite length, according to certain proportions and places, and appropriated to equal strains, whose equality is judged of by a correct and delicate taste. Two simple syllables can be pronounced only by two beats of the tongue, as *tana*,

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[* By a *beat* is meant, according to Fârâby, the beginning of a note, which is supposed to be formed by striking the string of a musical instrument.—E. S.]

between which there may be a longer or shorter time. A succession of such syllables may be pronounced with the times between the beats *equal* or *unequal.* If the *equal* times are repeated indefinitely, there can be perceived no recurrence of strains. But in order to this, there must be between each group of beats, a longer time. And then, if one of these groups, or strains exceeds another, though it be by only one beat, there is perceived in it a departure from the regularity of the measure, and the taste rejects it.

A group of beats between which the times are *equal,* is called a *connected rhythm;* a group between whose beats the times are *unequal,* is called a *divided rhythm.* The *connected rhythm,* when the time between the beats is the *shortest* appreciable, so short as not to be divisible into two beats, is called by Fârâby, the *quick hezaj.* This time corresponds to that which intervenes between the beats made in pronouncing two simple syllables, (Ar. *heavy sebab,*) as *tánâ*, and may be represented by the letter *a.* If the time between the beats be *double* that of *a,* the same master calls the rhythm the *light hezaj.* This time corresponds to that which intervenes between compound syllables, (Ar. *light sebab,*) pronounced consecutively, as *tán tán tán,* and may be represented by the letter *b.* If the time be *triple* that of *a,* he calls the rhythm the *light heavy hezaj.* It is, as if, in pronouncing a simple and compound syllable together, (Ar. *collected watad,*) and repeating the same consecutively, you were to make a beat only at the simple syllables, as *tánan tánan,* or *múfâ’ilun.* This time may be represented by the letter *c.* If the time be *quadruple* that of *a,* he calls it the *heavy hezaj.* It is as if, in pronouncing two simple syllables together with a compound one, (Ar. *fâṣileh,*) and repeating the same consecutively, you should make a beat only at the first at the two simple syllables, as *tátanan tátanan,* or *fá’ilun fá’ilun.* This time may be represented by the letter *d.* Further than this, you may go on separating the beats by as long times as you choose, and call them by any names that please you.—So much respecting the *connected rhythm.*

We come now to the *divided rhythm,* which also includes several subdivisions. In one, every *two* beats are followed by a longer time; and this is called the *first divided.* In another every ***three*** beats are followed by a longer time; and this is called the *second divided.* In a third every *four* beats are followed by a longer time; and this is called the *third divided.* The longer time in each case, is called a *divider,* (Ar. *fâṣileh.*)

The *first divided,* if the time between the two consecutive beats, be of the length *a,* is called the *quick first divided.* If the time be of the length *b,* it is called the *light first divided.* If it be of the length *c,* it is called the *light heavy first divided.* If it be of the length *d,* it is called the *heavy first divided.* The *divider* in each case must exceed the time between the consecutive beats. It may exceed it by a part, or parts, or the whole, or more. It is most appropriate, however, that in the *quick,* it be double; in the *light,* one and a half; in the *light heavy,* one and a third; and in the *heavy,* one and a quarter. The last is the longest of the dividers, and its time is equal to five of *a.*

The *second divided* may have its two times *equal,* in which case it is called the *equal triple;* or *unequal,* and then it is called the *unequal triple.* The *equal triple* has the same subdivisions as the *divided rhythm,* mentioned above. [Of the *first equal triple* the kinds in use are the *light* and the *light heavy;* and they are now called the *light remel.* Of the *second equal triple,* the Arabs call the *quick* and the *light,* the *light first heavy;* and the *light heavy* and the *heavy,* the *first heavy.*—Fârâby.] The *unequal triple* may have the shorter of the two times first, or the reverse. [The former is called the *unequal triple,* or *second heavy.*—Fârâby.] In either case, if the shorter be of the time *a,* then the longer is either double, or triple, or quadruple of *a.* If the longer be double of *a,* the *divider* must be triple of the same; if it be triple of *a,* the *divider* must be quadruple of it; and if it be quadruple, the *divider* must be quintuple. If the shorter be double of *a,* the longer will be triple of the same. If the shorter be triple of *a,* the longer will be quadruple of it, &c. If the shorter precede the longer, and is of the time *a,* it is called the *quick unequal triple.* If it be double of *a,* it is called the *light unequal triple.* If it be triple of *a,* it is called the *light heavy unequal triple.* If it be quadruple of *a,* it is called the *heavy unequal triple.*

Of the above *unequal triple*, the kinds in use are the *light* and the *light heavy.* The *heavy* and the *quick* are but little used. The Arabs call the *heavy*, the *second heavy.* The *quick* and the *light* are sometimes called the *mâkhûry*, and sometimes the *light second heavy.* If the longer time precedes the shorter, its three varieties are called [the *unequal triple* or] *remel;* [and all the three varieties are in use.—Fârâby.] So much may suffice respecting rhythm in general.[*]

§ 3. *Descriptions of the specific Rhythms used by the ancient Arabs.*

[From the same author as the preceding.]

We now come to the rhythms of particular strains, in current use among those who practice this art.[†]

1. By the *first heavy* is meant, in our day, a collection of beats at unequal distances, embraced in a strain equal in length to *sixteen* beats, with the time *a* between each.

It may be expressed by *two watads*, a *fâṣileh*, a *light sebab*, and a *fâṣileh*, which will be in feet thus:

mufâ’ilun fa’ilun mufta’ilun.

Then you may give to each vowel a beat, thus:

/ / / /   / / /   / / / /
mufâ’ilun fa’ilun mufta’ilun,

and the times between the beats will be:

a b a b   a a b   b a a b

the last time *b*, being between the last beat in this strain, and the first in the next, in case of repetition.

[* Fârâby goes on to treat of the *equal quadruple*, and the *unequal quadruple;* and adds, that of all the varieties beyond these, none are used by the Arabs.—E. S.]

[† Fârâby's enumeration of them is as follows: *hezaj, light remel, heavy remel, second heavy, light second heavy, first heavy*, and *light first heavy.* These seven, he says, are all the rhythms current among the Arabs, and he explains their formation out of the general rhythms described above. The difference between him, and the author I am following, is, that one mentions only a *light heavy* in general, and the other specifies a *light second heavy*, and a *light first heavy.* I find that Ispahâny in his *kitâb el-aghâny*, mentions all the three, viz., the *light heavy*, the *light first heavy*, and *light second heavy.* All the other rhythms he mentions also, and adds a *remel ṭambûry.*—E. S.]

Or, you may suppress six of the beats, and retain only five ; thus,

/ / / / /
mufâ' ilun fa 'ilun mufta'ilun,

and then the times will be :

c c d b d

Two of these strains may also be regarded as one, so that each strain may consist of halves, with a *divider* between them ; thus :

/ // / /// / / /// | //// /// / ///
mufâ'ilun fa'ilun mufta'ilun | mufâ'ilun fa'ilun mufta'ilun
a bab aab b aab | a bab aab b aab

2. By the *second heavy* is meant, in our day, a strain half as long as that of the *first heavy*. It may be represented by the foot

mufâ'ilâtun.

Giving every vowel a beat, the beats will be as follows :

/ / / / /
mufâ'ilâtun,

and the times:

a b a b b.

Or, you may suppress the second and fourth beats ; thus :

/ / /
mufâ' ilât un,

and the times will then be :

c c b

3. The *light heavy* is a strain half as long as that of the *second heavy*. It may be represented by the foot

fa'ilun.

Giving a beat to every vowel, the beats will be as follows:

/ / /
fa'ilun

and the times will be :

a a b

4. Of the *remel* every bar is of the length of *twelve* beats, with the time *a* between each. But the second, sixth, eighth and twelfth are suppressed, and thus each bar is made

to consist of eight beats. It may be represented by the feet

/ / / / /   / / /
mufta'ilâtun fa'ilun,

and the times will be :

b a a b b   a a b.

Or, you may suppress four of these beats and leave only four; thus:

/ /   / /
mufta'ilâtun fa'ilun

and the times will be:

b d   b d

Some represent this rhythm by the foot *fa'ilâtun* repeated ; thus:

/ / / /   / / / /
fa'ilâtun fa'ilâtun
a a b b   a a b b

5. Inasmuch as *mufta'ilun* repeated is the same as *mufta'ilâtûn fa'ilun*, the former has been taken to represent the *remel.* And then, a strain of *remel* being divided into two equal parts, the half has been considered a strain, and called the *light remel ;* thus:

/ / / /
mufta'ilun
b a a b

Moreover, since the masters who practise this art, consider it necessary that a strain should be divisible into halves, like a verse of poetry, they have come to regard two strains of the *remel* as one ; and so of the *light remel.*

6. The *hezaj* is represented by a succession of *watads,* every two *watads* being considered a strain ; thus:

/ /   / /
tanan tanan
a b   a b

The Persians have very many melodies, of the *double remel,* of which every bar is of the length of twenty-four beats with the time *a* between them. The master can form an idea of them by conceiving each strain to consist of two beats upon some other than a stringed instrument, one of them being the first, and the other the nineteenth. And if he wishes to reduce this idea to practice, he may pronounce a *fâṣileh* and a *sebab* four times in each bar, giving a beat to the first vowel of the first and of the fourth *fâṣileh.* He will then find between these two vowels the space of seventeen [eighteen ?] beats, and between the last of the two and the first vowel in the next strain, the space of five [six ?] beats; thus;

/ /
fa’ilâtun fa’ilâtun fa’ilâtun fa’ilâtun
/ / / / / / / / / / / / / /
a a b b a a b b a a b b a a b b

The Persians have also many varieties not current among the Arabs, the most common of which is one called *fâkhity.* The length of its strain is twenty beats, with the time *a* between them. It may be represented by twice pronouncing a *light sebab* and two *fâṣilehs,* and giving a beat to the first vowel in each *sebab* and *fâṣileh ;* thus:

/ / / / / /
mufta’ilun fa’ilun mufta’ilun fa’ilun
b d d b d d

Sometimes this rhythm is varied by adding another *fâṣileh,* so as to pronounce three successively ; thus :

/ / / / / / / /
mufta’ilun fa’ilun fa’ilun mufta’ilun fa’ilun fa’ilun
b d d d b d d d

A single melody may be made to embrace all these different strains, if the composer is acquainted with the ratio one strain bears to another. For example, if he wishes to compose a tune of two rhythms, one the *double remel,* and the other the *second* [*first?*] *heavy,* he must set three bars of the latter against two of the former. For the *double remel* being of the length of twenty-four beats, and the *second* [*first?*] *heavy* of sixteen beats, three of the latter are equal to two of the former. In other words, the ratio between them, is that of 2 to 3, or 1⅓.

This example may help the composer in any case to unite several varieties of strains in one tune, if he is acquainted with the ratios the strains bear to each other. These are as follows:—The ratio of the *first heavy* to the *double remel* is 1⅓; to the *second heavy* 2; to the *remel* 2⅔; to the *light heavy* 5⅓; to the *fâkhity* 1⅗; to the *increased fâkhity* 1⅐. The ratio of the *double remel* to the *second heavy* is 1½; to the *light heavy* 3; to the *fâkhity* 1⅕. The ratio of the *increased fâkhity* to the *double remel* is 1⅙; to the *fâkhity* 1⅖; to the *second heavy* 1¾; to the *light heavy* 3½.* In this manner an estimate may be made of the ratio of each strain to every other, which is omitted here, on account of the almost infinite variety of proportion.

In all, keep in mind *two* things. One is, that the standard measure of every bar is the *quick hezaj*, the times between the beats of which are all of the length *a*. The other is, that a bar is never to be *single*, for then there can be no halves. All must go by *pairs*.

CHAPTER IV.

ON MUSICAL INSTRUMENTS.

§ 1. *Description of the ancient 'Ud.*

[Taken chiefly from the anonymous MS.]

THE most common and perfect of our musical instruments, is the *'ûd*, (Ar. guitar.) It has *five* strings, of which the bass (Ar. the highest,) is called *bem*, and the others in order are called *mithlath*, *methna*, *zîr* and *ḥâdd*. Their arrangement is such, that the entire of one string is equal to three fourths of the one below (Ar. above) it; [and between the entire of one string and the entire of the next, is an interval of a *fourth*.—Fârâby.] Thus two complete octaves are embraced between the *entire* of the *bem*, and the *binṣir* of the *ḥâdd*, the middle note being at the first ninth, [the *sebâbeh*,] of the *methna*.

[* In this paragraph there appear to be many mistakes in the manuscript, which I have not attempted to correct.—E. S.]

Moreover, *bands* are tied around the neck of the *'ûd*, at certain points, which serve to mark where the strings are to be pressed by the fingers, in order to produce particular notes. The custom is to have *seven;* and they are tied at the extremities of the *great third*, *direct* and *reversed*, the sharpest being at the extremity of the first quarter, in each string. [See Fig. 1.]

Let the figure A B C D represent the five strings of the *'ûd*, A D being the head, and B C the bridge. Take one ninth of A B from A and tie the band 4; and the note of A, or the entire string will be 1⅛ of the note of 4. Then take one ninth of 4B, and tie the band 7; and the note of 4 will be 1⅛ of the note of 7. Then take one fourth of A B, and tie the band 8; and the note of 8 will be the fraction of a tone that belongs to the *great third.* Hence these three bands will be at the extremities of the *great third*, *direct.* [Or, inasmuch as between A and 8 there is an interval of a *fourth*, and between A and 4, and 4 and 7, respectively, there is a whole tone, there will be between 7 and 8, a fraction of a tone, (Ar. a remnant.) Hence it appears that these bands are tied at the extremities of the *great third*, (Ar. *dhu el-muddetein el-kawy*, strong ditone.)—Fârâby.] The band at 4 is called the band of the *sebâbeh*, (Ar. fore finger,) that at 7, the band of the *binṣir*, (Ar. ring finger,) and that at 8, the band of the *khinṣir*, (Ar. little finger.)

For the bands of the *great third*, *reversed*, divide B8 into eight parts, add to it one part from 8A, and tie the band 5; and the note of 5 will be 1⅛ of the note of 8. Then divide B5 into eight parts, add to it one part from 5A, and tie the band 2; and the note of 2 will be 1⅛ of the note of 5. The band at 5 is called the *old wasṭa*, (Ar. middle finger,) and the band at 2 is called the *zâid.* The notes of A, 2, 5, and 8, will be the order of the *great third*, *reversed*, called the *sharper second doubled.*

Then take three fourths of B2, and mark the point X, add to it one eighth of itself, and tie the band 6, called the *wasṭa of zelzel;* and the note of 6 will be 1⅛ of the note X.*

[* There seems to be some error of the manuscript in this direction. Fârâby directs to tie the band of *wasṭa zelzel* half way between the *binṣir* and the *Persian wasṭa*, soon to be mentioned.—E. S.]

Then divide B6 into eight parts, add to it one part from 6A, and tie the band 3, which is called the *mujennab.*

These are the seven bands, that are tied upon the neck of the *'ûd.*—Most frequently the band 3 is tied half way between 2 and 4; and sometimes half way between A and 6. But in all the three cases, it is called the *mujennab.* Sometimes a band is tied half way between the *sebâbeh* and the *khinṣir*, which is called the *Persian wasṭa.* This is much used in our day, and the *zelzel* and *zâid* are but little used. [Fârâby directs to tie the *Persian wasṭa* half way between the *sebâbeh* and the *binṣir;* * and he adds that the *wasṭa* which occurs in reversing the *great third*, (i. e. *the old wasṭa*,) was used in his day, not as the *wasṭa*, but as the *mujennab of the wasṭa*, while one of the other two was used as the *wasṭa.*—E. S.]

Fârâby, [says our anonymous author,] has in his book a table of the numbers of these bands, which we insert here, adding the names of the proportions, for the sake of elucidation.

The entire string,		20,936
The mujennab of the sebâbeh	for the reversed great third,	19,683
“	“ for the halving of the first tone,	19,584
“	“ for the Persian wasṭa,	19,072
“	“ for the wasṭa of zelzel,	18,816
The sebâbeh,		18,432
The mujennab of the wasṭa, [old wasṭa]		17,436
The Persian wasṭa,		17,408
The wasṭa of zelzel,		16,896
The binṣir,		16,384
The khinṣir,		15,552

[The *'ûd,* thus tuned, is made the basis of the musical scale of our anonymous author, and also of 'Abd el-Ḳâdir, a Turkish writer referred to by Kosegarten in his introduction to the *kitâb el-aghâny.* Each note is expressed by the number it bears in the diagram, (Fig. 1,) from 1 to 35, being two octaves.

The *original 'ûd* had but four strings, and these, in the

[* The disagreement is probably owing to an error in one of the manuscripts. The reading in Fârâby accords best with the proportions given in the subsequent table, as it brings the *Persian* and the *old wasṭa* very near together.—E. S] time of Ispahâny, appear to have been marked by only four bands, called the *sebâbeh*, *wasṭa*, *binṣir*, and *khinṣir*, being the names of the four fingers. After the same fingers also the *strings* seem, in his day, to have been named, the word *mejra* (Ar. course) being prefixed; and his only method of naming a note, is to mention the string and band, where it is formed,—which method of distinguishing the notes by the fingers, he says, was first introduced by Isḥâk ibn Ibrahîm, of Mosul, who died A. H. 235. For example, in connection with almost every ode, Ispahâny names the tune to which it was sung, mentioning for this purpose, the rhythm of the tune, and what I suppose to be its key note, after the following mannėr,—e. g. 'its tune is the *light remel*, with the *sebâbeh*, on the *mejra* of the *binṣir*'; which reminds one of the captions of some of the Psalms,—e. g. "To the chief musician, with *neginoth*, upon the *sheminith*." See Ps. vi.

Fârâby expresses the *fifteen* notes of two successive octaves, by certain Arabic letters, which Kosegarten regards as corresponding to the letters used in the European musical scale; thus:

ا	ج	د	ه	ر	ح	ط	ي	ك	ل	م	ن	س	ع	ف
A	H	c	d	e	f	g	a	h	c̄	d̄	ē	f̄	ḡ	ā

His division of the scale is such, that he finds and treats of the following intervals, viz., *quarter tone*, *minor semitone*, *major semitone*, *whole tone*, *ditone*, *fourth*, *fifth*, *octave*, *eleventh*, *twelfth*, and *double octave*.—E. S.]

§ 2. *Description of different Modern Instruments.*

The variety of musical instruments is so great, [says Meshâḳah,] that we shall select only a portion of them, taking those which are the most important. They are of *two classes*. One embraces such as belong simply to the department of rhythm, i. e. the measurement of time: as the drum, tambourine, &c. The other includes such as belong to melody. It is of the latter only that we design to speak. They are of *two* kinds; viz., *stringed* and *wind instruments.*

1. Among the *stringed* instruments, is the *'ûd.* It has *seven* strings, each of which is double, to increase the strength of the sound ; only four of the seven, however, are much used. The first string on the left of the *'ûd*, is tuned to the *base to jehârgâh ;* the second is tuned to *rest ;* the third to *nawa ;* the fourth to *dûgâh ;* the fifth to *'ösheirân ;* the sixth to *bûselîk ;* and the seventh to *nehuft.* Thus each string is fourteen quarters* above the string on its right, or the base of that string ; and the interval between the pairs of strings is of three tones or not, according to the occurrence of the greater or smaller interval.

Moreover there is a *mark* made across the lower part of the neck of the *'ûd*, under the strings, at the distance of one third from the head to the bridge. Its use is, that if you press upon any string over this mark, and then strike the string, the sound may be the same with that of the entire string next above, or with the response to that string. For if you take *two thirds* of the string of a musical instrument and strike it, the sound will be about fourteen quarters higher than the sound from the whole ; and from the *half*, the sound will be the response to the sound from the whole. E. g. if the length of a string consists of 3,456 parts, then will the half, viz. 1,728 be the length occupied by the first octave, and 1,148 the length occupied by the fifth, which is about a third of the whole, being only $\frac{1}{288}$th less than a third. The following table shows the length occupied by every interval, and every quarter, of the first octave. For the second octave, the distances will be half as great ; for the third, a fourth as great, &c. The proof of the whole will be evident to one who is acquainted with the principles of geometry.†

[* My MS says *ten* quarters, which is evidently a mistake.—E. S.]

† See § 4th of this Chap.

TABLE.

	Parts	Parts	Parts
Base to nîm-ḥiṣâr,	95		
Base to hiṣâr,	93		
Base to tek-ḥiṣâr,	91		
'Ösheirân,	89	368	
Base to nîm-'ajem,	87		
Base to 'ajem,	85		
'Arâḳ,	83	255	
Kuwesht,	81		
Tek-kuwesht,	79		
Rest,	77	237	
Nîm-zergelâh,	75		
Zergelâh,	73		
Tek-zergelâh,	71		
Dûgâh, (the fifth from yegâh,)	69	288	1,148
Nîm-kurdy,	67		
Kurdy,	65		
Sîgâh,	63	195	
Bûselîk,	61		
Tek-bûselîk,	59		
Jehârgâh,	57	177	
'Araba,	55		
Ḥejâz,	53		
Tek-ḥejâz,	51		
Nawa, (the response to yegâh,)	49	208	580
Total of parts in the first octave,			1,728

The four strings most used are *rest*, *nawa*, *dûgâh*, and *'ösheirân*. The other notes are obtained by pressing upon these strings with the ends of the fingers of the left hand. The manner of ascending and descending the octaves, is the following. *Yegâh* is taken from the *base to jehârgâh* by pressing upon it with the fore finger. *'Ösheirân* is taken from the fifth string entire. *'Arâḳ* from the same string with the fore finger. *Rest* from the same also, with the ring finger; or sometimes from the second string entire. *Dûgâh* from the fourth string entire. *Sîgâh* from the same with the fore finger. *Jehârgâh* from the same also, with the ring finger. *Nawa* from the third string entire. *Ḥuseiny* from the same with the fore finger; also *Auj* with the ring finger; and *mâhûr* with the little finger. For *muḥaiyar* press upon the same third string with the fore finger at the point where the mark is drawn on the neck of the instrument; then for *buzrek* press upon it with the middle finger; for *mâhûrân* with the ring finger; and for *remel-tûty* with the little finger. In *descending* proceed in a reversed order note by note to *muḥaiyar.* Then, from the fourth string, reckoning from the mark toward the bridge, take *mâhûr* by pressing with the ring finger; *auj* with the middle finger; and *ḥuseiny* with the fore finger, [i. e. over the mark.] After which, take *nawa* from the third string entire, and then, returning to the fourth, complete the descent by reversing the order of the ascent.

When a *quarter* is wished instead of a regular note, in the circumstances described in the third paragraph of Chap. I. § 5, it is obtained by moving the finger up or down, as the case may be, on the string from which it is to be taken.

Another stringed instrument is the *Frank kemenjeh;* which has four strings. The thickest of them, on the right, is tuned to the *base of rest;* the next is tuned to *yegâh;* the third to *dûgâh;* and the fourth, which is the finest, to *nawa.* The remaining notes and the quarters, are taken from these strings, as in the *'ûd*, by pressing them with the fingers of the left hand.

The *Arab kemenjeh* has two strings; the one on the left tuned to *nawa*, and the other to *dûgâh*, or sometimes to *rest.* The other notes and the quarters, are obtained by the fingers, as above. Though of a very pleasing sound, it is defective, and the performer is obliged, in the place of some notes, as *'arâḳ*, *'ösheirân* and *yegâh*, to use their responses.

The *ṭambûr* has generally eight strings, the four on the right being tuned to *yegâh*, and the other four to *nawa.* The other notes and the quarters, are obtained by pressing on these strings with the fingers, bands being tied round the neck of the instrument for every note and every quarter, to guide the performer. It is considered the easiest, and the most complete, of all musical instruments.

The *ḳânôn* is of the highest order of musical instruments. It sounds like two instruments played together; inasmuch as, during the performance, the performer has all the notes he needs, with their bases and responses, spread out before him, and both his hands at liberty to touch any note and its octave, at the same time. And with all this, there are three strings for each note, so that it is equivalent to six *kemenjehs* played together. Ordinarily it has twenty-four notes, with three strings of equal size to each note. The highest note is generally the *response to ḥuseiny;* though some make it the response to *nawa*, i. e. *remel-tûty*. Then each note follows in order one by one, to the lowest of the twenty-four. In this way, the instrument embraces three octaves, and three notes. The lowest octave is from the *base to the base to jehârgâh*, to the *base to sîgâh ;* the second from the *base to jehârgâh*, to *sîgâh;* the third from *jehârgâh*, to *buzrek ;* and then there remain the three notes, *mâhûrân*, *remel-tûty* and the *response to ḥuseiny*. No provision is made in this arrangement except for the regular notes. If the performer wishes to play tunes in which quarters are substituted for notes, he accomplishes it by tightening or loosening the necessary strings before commencing.

2. The *wind instruments* are very numerous. Among them are the *nây*, *kerift*, *mizmâr*, *sŭrnây*, *urghun*, and *jenâḥ*. All, but the last, are pierced with holes, which the performer shuts with the ends of his fingers, except as he has need of them in the course of a tune. They are generally arranged so as to give forth the regular notes. If a quarter is needed, the performer obtains it by partially opening the hole intended for the note next above. There are other expedients, also, by which musicians contrive to express notes for which no provision is made ; as, for example, by shutting certain holes and opening certain others simultaneously. The *jenâḥ* consists of tubes, set in a collar, which presses upon their mouths. Being of different lengths, they give out different sounds on being whistled in, corresponding to the different notes.

§ 3. *Erroneous directions for adjusting instruments, corrected.*

I have perused many books on the art of music, but have found none that attempt to demonstrate to the learner practically the nature of the tones ; any farther than the general statement, contained in all, that sound, from the base to the response, is divided into twenty-four quarters, which are embraced in seven tones, some of them of four and some of three quarters ; as has been explained in Chap. I. But these generalities are of little use to the learner, who would know how to form these different intervals in practice.

Moreover, in the year of the Hegira 1236, having left my native town, Deir el-kamar, by reason of a disturbance there, I came to Damascus, and here had opportunity of receiving instruction from the sheikh Muḥammed el-'Aṭṭâr, a master of several sciences and much learning. Thus it happened that I was present at many an argument between him and 'Abdallah Effendy Muhardâr on this subject; until finally the former wrote a book, in which he allows that the objections of the Effendy prove in practice to be valid, but denies that their author can demonstrate them, any farther than by asserting, that if his (the sheikh's) directions are followed, the result will not be what he predicts.

The sheikh's doctrine was, that if the string of a *tambûr* whose sound is, e. g. *yegâh*, be divided in the middle by a *band*, the sound of the half will be *nawa*, the response of *yegâh*. Then, if the half between the band and the head, be divided into twenty-four *equal* parts, also by bands, the sound at the first band, next the head, will be the *base to nîm-ḥiṣâr*, that at the second the *base to ḥiṣâr*, at the third the *base to tek-ḥiṣâr*, at the fourth *'ösheirân*, and so on up to the band first tied at the middle of the string. Then divide again in the middle, the half between *nawa* and the bridge, and you will have *remel-tûty*, the response to *nawa*. And still again divide the quarter between *remel-tûty* and the bridge, and you will have the response to *remel-tûty;* and so on ad infinitum. Then divide each of these portions into twenty-four equal parts, and you will have the twenty-four quarters of each octave.

But the above doctrine of the sheikh, except so far as relates to the successive divisions of a string into halves for responses, is erroneous. Dividing any of the halves into twenty-four *equal* parts, as directed, will not, in practice, give the quarters. The truth is, that the distance between the bands for any two quarters is proportioned to the length of the string. Which may be made to appear as follows. Since the first response is at the half of the string, and the second at the half of the half; it follows, that, at whatever point you press the string, its note will be the base of what you will obtain by pressing it half way between that point and the bridge. Hence, inasmuch as the distance between these two points must contain the twenty-four quarters, the shorter the distance between the first point and the bridge, in other words, the length of the string, the shorter the quarters. Again; since the first half of the string is divided into twenty-four quarters, and the half of the remainder, i. e. the quarter, is divided into the same number; it follows that a quarter in the second portion is, in length, the half of a quarter in the first division,—which diminution, again, is owing to the shortening of the string.

The same is plainly shown also by the aid of the diagram, (Fig. 2.)

Draw A B of any length you choose, and let it be the base of a right angled triangle; draw the perpendicular A C of the length of the first quarter on a *ṭambûr;* and then unite C and B for the hypothenuse. Divide the base in the middle at D; divide A D into twenty-four equal parts; and from each division draw lines parallel to the perpendicular A C, until they meet the hypothenuse C B. Then, inasmuch as A C is the length of the first quarter, will these lines determine the length of each quarter in succsssion, to the end of the first octave.—Then, if you wish to determine the length of the quarters of the second octave, halve D B at E, and proceed with D E as above.—From the diagram thus drawn it appears that the quarters diminish in a certain ratio, and not, as the sheikh taught, that the quarters of the first octave are all of equal lengths, and those of the second also equal and just the half of them. For in that case would the distance from *jehârgâh* to *nawa*, be double that from *nawa* to *ḥuseiny;* which cannot be between two similar contiguous intervals, but only when a complete octave intervenes. Thus we have seen the error of our sheikh; and having entered upon the subject, I propose to close my treatise, by accurately demonstrating, arithmetically and geometrically, the exact method of forming the interval of every quarter, and every tone.

§ 4. *Correct rules for adjusting instruments, developed.*

To determine *arithmetically* the length of each quarter, on the string of a *ṭambûr*, the process is as follows. Take

24 and multiply it into itself, until you have raised it to the 24th power; and that will be the denominator to the fraction of this problem. Divide this denominator by 24, and the quotient will be the numerator for the first quarter. Subtract this from the denominator, and divide the remainder by 24, for the numerator of the second quarter. Subtract this again, and divide as before; and thus proceed, until you have obtained the numerators of all the twenty-four quarters. Then deduct the sum of all these numerators from the original denominator; and distribute what remains, to the several numerators by the rule of proportion, so that the sum of all the numerators shall be equal to the original denominator. Then, whatever the numerator of any quarter [thus increased] amounts to, will bear the same ratio to the entire denominator, that the length of that quarter does to the half of the string.

Geometrically we proceed as follows. In the parallelogram A B C D, (Fig. 3,) let A B be the length of half the string of a *ṭambûr*, and let A D be one twenty-fourth of the same. Mark the point G two thirds the distance from B to C, and the point I half the distance from D to C; and draw a line from G through I, till it meet A D extended, at H. Then will the third which is taken from B C, be added to A D, and what is taken from L B C I will be added to A L I D, and A H will be double B G. Moreover, add to A B a line equal to itself, and do the same with H G; and they will meet at K, forming a right angled triangle, whose base is equal in length to the string of the *ṭambûr*, and the section A B G H of this triangle, will represent the first octave. In this section A H represents the first quarter, and B G which has been proved to be the half of it, represents the first quarter of the second octave. Hence it appears, that into whatever equal intervals you may wish to divide the octave on a string of the *ṭambûr*, you must add a third to the length of the first, and take a third from the length of the last. E. g. if you wish the *larger tones*, such as *'ösheirân*, which are each four *carats* (Ar. *ḳirâṭ*, a twenty-fourth) i. e. four twenty-fourths of the octave, then will the length of the first tone be 5⅓ carats of the half of the string, and the first tone of the second octave, 3⅔ carats. If you wish the *smaller tones*, such as *'arâḳ*, which are 3 carats of the octave, then will the first tone on the string be 4 carats of half its length, and the first tone of the second octave 2 carats. If you wish *quarters*, which are each a carat of the octave, then will the first quarter be 1⅓ carat of the half of the string, and the first quarter of the second octave ⅔ carat.

Having explained these principles, we are now prepared to draw a diagram, which will furnish the exact measurements for the bands of every tone and quarter on any given *ṭambûr*. Draw A B, (Fig. 4,) the base of the right angled triangle A B C, of any length you choose, and let the perpendicular A C be one ninth of the length of the string of the *ṭambûr*. Then halve A B at D, and divide A D into twenty-four equal parts, writing opposite the several parts the names of the twenty-four quarters of the first octave in their order.* Then halve D B at E and divide the half D E in like manner, writing opposite the several parts, the names of the quarters of the second octave in their order. From F on the perpendicular, at three-fourths the distance from A to C, which will be one-twelfth of the length of the *ṭambûr*, draw the line F B; and from G, at one-fourth the distance from A to C, equal to one thirty-sixth of the length of the *ṭambûr*, draw the line G B. Call C B the line of the larger tones, F B the line of the smaller tones, and G B the line of the quarters. Then, from the *middle* of each of the forty-eight parts into which A E is divided, raise a perpendicular extending to the line of the quarters G B; and these several perpendiculars will be the length, on the *ṭambûr*, of the several quarters whose names are written opposite the parts on which the perpendiculars stand. As to the tones, *yegâh* being the sound of the entire string, is not provided for in the diagram. The length of the rest may be ascertained in different ways. One way is by adding together the lengths of the several quarters which belong to each. Another is the following; take for each tone, the portion of A E which belongs to the quarters of that tone, and from the *middle*† of it raise a perpendicular, extend-

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[* Instead of the names, I have used the numbers and letters, introduced into the first Table in Chap. I.—E. S.]

[† The ninth of the length of the *ṭambûr* being equal to "5⅓ carats" of half its length, it would appear from the demonstration, (Fig. 3,) that A C ought to be the length, on the *ṭambûr*, of the tone *'ôsheirân*. But then it would be ing, for the larger tones, to their line C B, and, for the smaller tones, to their line F B; and these perpendiculars will be the length, on the *ṭambûr*, of the several tones to which they belong. E. g. for *'ösheirân*, which is one of the larger tones, take the portion of A E which is between *yegâh* and *'ösheirân*, (1 and 2 on the diagram,) and from the middle of it raise a perpendicular extending to C B; and for *'arâḳ*, which is one of the smaller tones, take the portion which is between *'ösheirân* and *'arâḳ*, (2 and 3 on the diagram,) and from the middle of it raise a perpendicular extending to F B.

It has been already mentioned in the former part of this treatise, that the modern Greeks have a different division of the octave from the Arabs; but it was not made to appear whether this difference is real, so that the Greeks actually make the note *jehârgâh*, for example, lower in singing than the Arabs, or whether it is in theory only, arising from an erroneous view of the division of the intervals by the one nation or the other. Nor do I find any of the Arabs attempting to support their view, or to explain how the matter stands; which indeed could be successfully attempted only by the most thorough masters who have a competent knowledge of mathematics. For my own satisfaction, I have taken two *ṭambûrs*, one adjusted according to the preceding diagram, and the other according to the custom of the Greeks, and tried the tones of both, by playing upon them certain melodies with which I was well acquainted. The result was, that the tones of both fell into the same graduation, and the error is in the division into quarters by the Arabs, while the Greeks are right in their division.

To adjust an instrument according to the Greek division, the preceding diagram needs to be altered, by dividing A D and D E each into sixty-eight parts for seconds, which are to be distributed among the tones in the proportions mentioned

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longer than the sum of the perpendiculars of the four quarters which compose the tone; for it is only the *first* of these quarters that is "1⅓ carat" of half the length of the *ṭambûr*, each of the others being smaller. Nor, indeed, does that hold true even of the first quarter, for this is divisible also into parts, and the demonstration applies only to the first part, and that an infinitesimal in quantity. Our acute author has provided for this difficulty, by raising a perpendicular from the *middle* of each tone and each quarter; as such a line will always represent the sum of the perpendiculars of any number of portions, however great, into which a tone or quarter may be divided.—E. S.]

in Chap. I, § 2; and the perpendicular, being first made two-seventeenths of the length of the *ṭambûr*, and divided into twelve parts, is to have the line of the largest tones drawn from its extremity to B, the line of the middle tones from nine-twelfths of its length, the line of the smallest tones from seven-twelfths of it, and the line of seconds from one-twelfth.

CONCLUSION.

We must just glance, in concluding, at what the ancients have taught respecting the medicinal properties of melodies, which led them to use them in curing diseases. According to them, [following the ancient classification of medicines,] *jehârgâh* is hot-dry, and exciting to the blood; *auj* and *nawa* are cold-dry; *ḥuseiny* and *dûgâh*, on the contrary, are hot-moist; and *rest* and *sîgâh* are cold-moist. Thus classified, they were used by the practitioner, as he thought the constitution of the patient required.

But what I think about it is, that a man is cheered by a tune to which his taste inclines; and that inclination springs, not from constitutional peculiarity, but from habit and familiarity. What refutes the doctrine of the ancients is, the existence of national tastes in regard to tunes; all in a given nation having a partiality for such airs as they have heard from their infancy, and that, though there must be among them every variety of constitutional temperament.

And now, says its author, (dependent upon the Most High,) Mikhâil the son of Jirjis Meshâḳah, this is as far as my imperfect knowledge has reached; and I beg of its readers, to close their eyes to what there is in it of defect, and to correct its mistakes. Exalted and glorious be He who has no defects! The End.

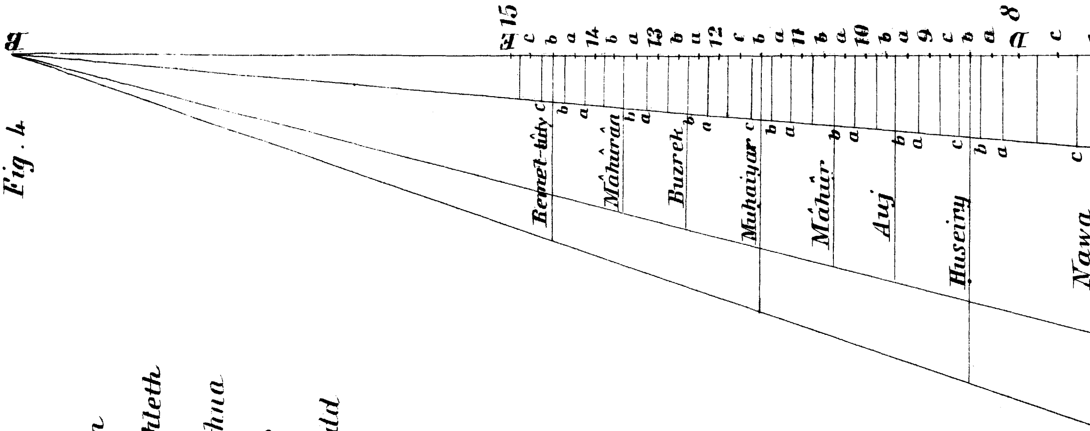


Fig. 4

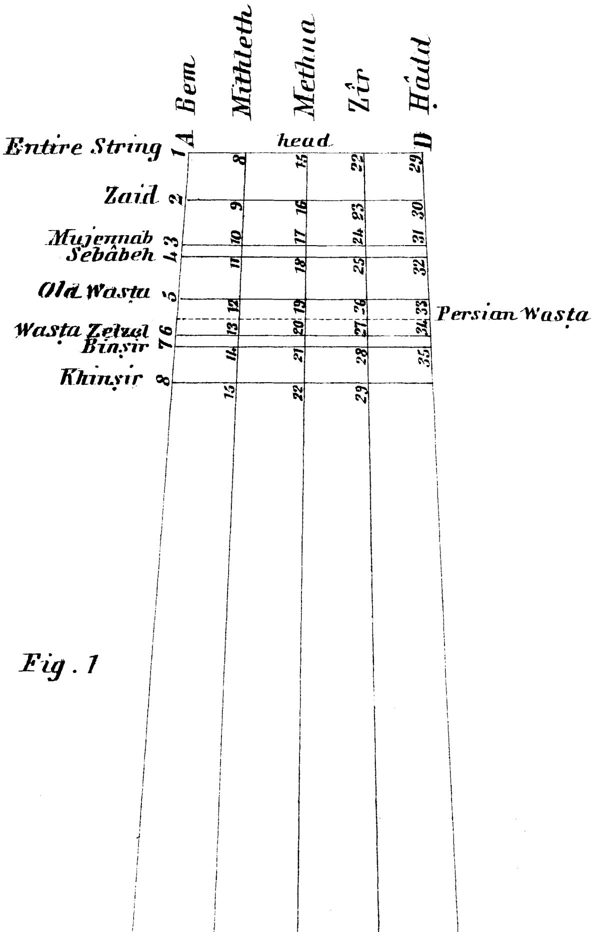
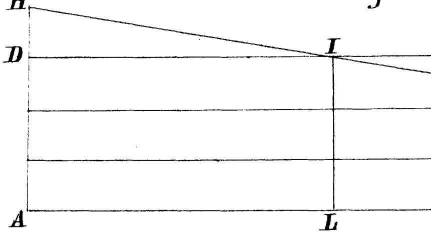


Fig. 1

Fig. 3



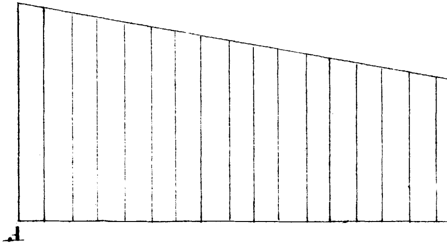


Plate 2.

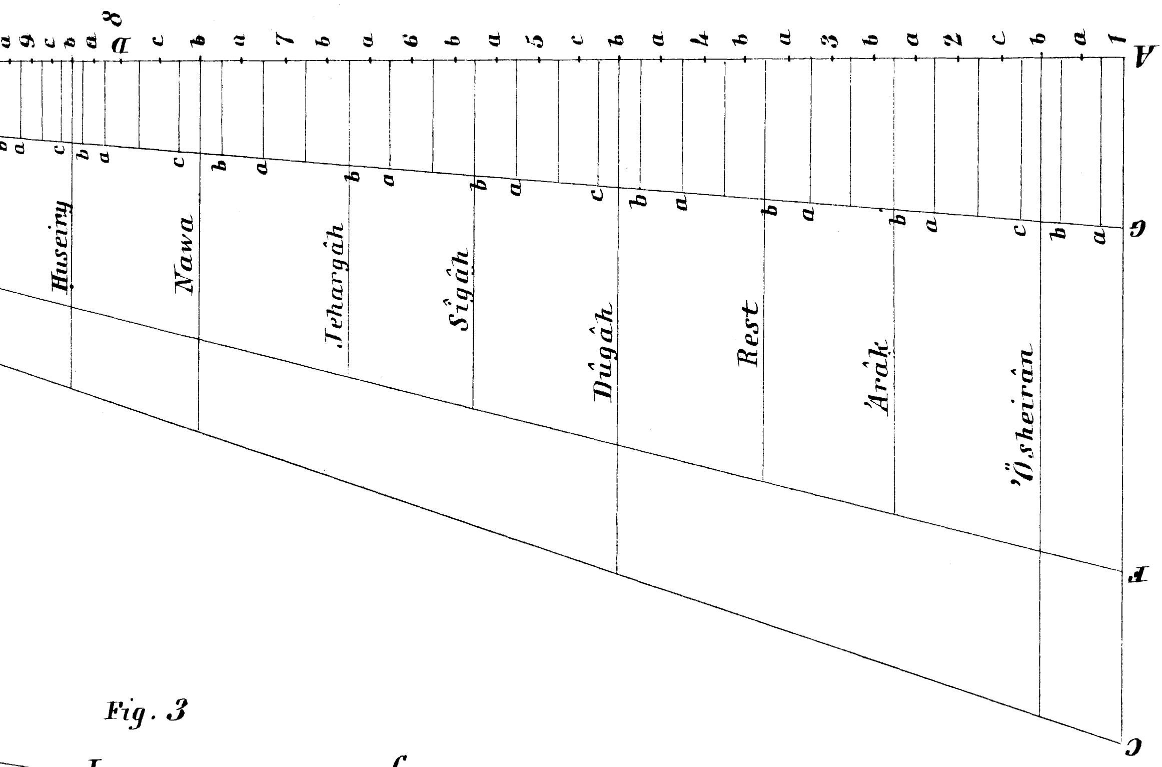


Fig. 3

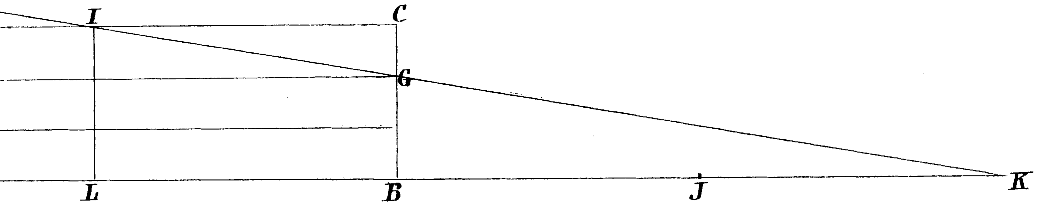
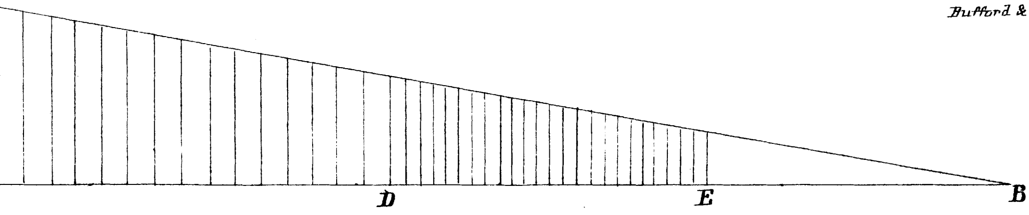


Fig 2



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